THESIS

REVIVAL OF HEJAZ TRIBAL EMBROIDERY USING DIGITAL DESIGN TECHNOLOGY:

A COLLABORATIVE DESIGN PROCESS ENGAGING SAUDI FEMALE ACADEMICS

Submitted by

Sahar H. Ejeimi

Department of Design and Merchandising

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Master's Committee:

    Advisor: Diane Sparks
    Co-Advisor: Yan, Ruoh-Nan

    Ajean Ryan

ABSTRACT

REVIVAL OF HEJAZ TRIBAL EMBROIDERY USING DIGITAL DESIGN

TECHNOLOGY: A COLLABORATIVE DESIGN PROCESS ENGAGING SAUDI

FEMALE ACADEMICS

The purpose of the study was to create a collection of professional dress ensembles for Saudi female academics based on their preferences. Two models underpinned this research study: the FEA consumers' needs model combined with the collaborative design model in order to engage study participants into the design process.

A mixed methods approach was implemented in this study in terms of data collection process to examine participants' FEA preferences within two phases of the design process. First data were collected via online survey from eight participants to evaluate and give suggestions for the eight preliminary sketches. The data were used as feedback to refine the designs in the second phase. The final phase of the project included data collection onsite in Jeddah, Saudi Arabia, using questionnaires and focus group discussion with 12 participants. This data helped assess whether the final garment collection met participants' professional needs, and if participants would be willing to wear them.

Results from this study showed that the ratings for the final garments were generally higher than the first sketches in the first phase. Results revealed that the aesthetic aspect was rated the most preferred by the participants among the FEA aspects. Results also indicated that Silver Waves design received the highest rating among the designs in terms of FEA aspects. Qualitative results showed that participants were willing to wear the garments in this study as the garments represented heritage, looked contemporary, and had versatile uses. Participants were also willing to pay more for culturally inspired work attire. Discussion and conclusions are presented.

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CHAPTER I

INTRODUCTION

In most cultures, the standardization of global fashion influence has reached workplace attire. Eicher and Sumberg (1995) found that the ethnically neutral style of the unisex business suit in the professional setting has been adopted worldwide. Dating from the 1970's in Saudi Arabia, as women began to acquire higher education and enter the working world in sectors such as business, medicine, and education, they were observed to wear Western style clothing in the workplace (Hamdan, 2005; Vidyasagar, 2004; Yamani, 1997).

Hamdan (2005) adds that Saudi women's ability to seek higher education came at relatively the same time as industrial global fashion, which along with the perceived prestigious position in society for Saudi academics led the tendency to wear Western or global fashion style. At the present time most Saudi faculty members and staff in academia dress in Western style clothing. Al-Dabbagh (2006) found that between 1981 and 2004 there was a striking shift toward more Westernized dress in Saudi Arabian women's preferences for dress for private social functions as well. Moreover, Le Renard (2008) observed that Saudi women who attended a university in Saudi Arabia adjusted their appearance to reflect Western fashions, although they also followed the dress code of the university such as wearing long skirts and elbow length sleeves.

According to Barnes and Eicher (1992), dress acts as a means to convey the historical, geographical, locale, age, and social related identities that frame the self. "In many ways, the academic context is more privileged than some other contexts of every day labor (e.g., the business world, pink collar work). Depending on their relative status in the academy, women

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have economic resources as well as some room to roam aesthetically and politically" (Kaiser, Chandler, & Hammidi, 2001, p. 120). Given this freedom and considering the preponderance of global Western fashion trends, are there alternate possibilities for culturally aesthetic aspects of academic attire within diverse cultures?

Although the global fashion industry offers working women worldwide choices for appropriate workplace clothing, it does not generally include culture-specific aesthetic design features. Research has suggested that what globalization has brought to standardization in dress and its decoration has led to diminishing ethnic differences in dress (Eicher & Sumberg, 1995; Topham, Landreau & Mulliagn, 1982). Ethnic decorative influences are further minimized by advances in technology where machines have replaced traditional hand sewing and embroidery (Gillow, 2010; Topham et al., 1981). Even beyond the workplace, it is now common to see women in most regions of Saudi Arabia wearing Western contemporary dress as everyday attire in private situations.

Traditional dress used to be manually embroidered and sewn; however, with industrialization, the use of technology and machines have mostly replaced manual work (Topham et al., 1981). The use of digital technology also has made a contribution to the realm of textile and garment design and manufacturing. According to Parsons and Campbell (2004), digital textile design and printing is a new technology that has provided designers many options for design possibilities with flexible advantages in terms of design adjustments and manipulation before the textiles are produced. Digital technology is also widely used for fashion illustration and garment pattern drafting.

Women in Saudi Arabia, an Islamic country, wear Hijab in all public and private situations where non-related adult males exist, and this is considered a dress code (Long, 2005; Rabolt & Forney, 1989; Stillman, 2000; Topham et al., 1982). Saudi females are influenced by the Islamic faith that calls for modest clothing, when they present the desired look of self (Tawfiq, 2012). Wearing the Hijab which is a veil to cover women's hair and neck and the Abaya, which is a cloak-like outer covering, are required in Saudi Arabia, (Long, 2005; Rabolt & Forney 1989; Stillman, 2000; Topham et al., 1982). In addition, Saudi women often wear the traditional style of head cover today, which is a plain black or any other color scarf (Long, 2005; Topham et al., 1981). As for dress in private situations, during instances when non-related males are *not* present, women do not wear Hijab or Abaya, and their choice of dress is influenced by various factors. Those factors include tribal heritage, geographical region (urban versus rural or Bedouin), level of education, socio-economic status, level of contact with Western culture, and age (Fatany, 2007; Rabolt & Forney, 1989; Yamani, 2004).

Many studies within the Arabic language literature have focused on the significance of valuing the heritage of ethnic dress by developing clothing patterns, and creating motifs and decorations that are inspired from Saudi ethnic dress. Ethnic dress also serves to distinguish the identity of persons from different regions (Khogeer, 2005; Labban, 1990; Meimany, 1996; Maglan, 2007; Shata, 2007). Most studies and projects consider design elements in traditional ethnic dress as heritage or cultural folklore with little mention of adopting these elements for everyday dress or for dress in a professional context. Saudi females showed appreciation for a stylish contemporary look that would make them look modern (Tawfiq, 2012).

Recent statistics show that 80% of the female workforce in Saudi Arabia works in education (Yusuf, 2012). This infers an increasing demand for professional or academic attire.

Even though working women may prefer to wear Western Style clothing in their professional lives, many still wear ethnic dress embellished with traditional embroidery for special occasions (Eicher & Sumberg, 1995; Iskandarani, 2006; Long, 2005; Topham, et al., 1981). This might suggest that Saudi women do not want to omit their own culturally ethnic dress completely from their wardrobe. And it remains a possibility that Saudi female academics might be interested in the idea of wearing professional attire that has been inspired by Saudi ethnic design elements such as style lines from the traditional Thawb and embroidery patterns and motifs.

Purpose

The purpose of this data-based research was to create a collection of professional dress ensembles for Saudi female academics based on their preferences. The textile and apparel designs were inspired by ethnic embroidery of the Hejaz, a western province in Saudi Arabia. Two models were used in the research. The FEA model was used to contextualize the functional, aesthetic, and expressive needs of the study participants, and to define the Saudi female academic preferences for work attire. An adapted participatory design model was used to inform a collaborative design process in which Saudi female academics were engaged in the design process as participants. The ultimate goal of the research was to establish an approach to collaboratively designing a product line of professional attire for Saudi female academics in Hejaz. The design line created in this study combined traditional Hejazi tribal embroidery techniques with state-of-the-art digital textile printing, illustration, and pattern drafting technology.

Research Questions

- Is it possible to combine traditional Hejazi embroidery patterns with digital printing technology?

- Will Saudi female academic professionals in Jeddah be interested in wearing professional attire that has ethnic-inspired, CAD printed fabric embellished with hand embroidery in comparison to their usual work attire?

Objectives

1. To produce a collection of professional attire that had Hejazi-inspired, CAD printed fabric embellished with hand embroidery for Saudi female academics, and to evaluate the collection based on their FEA preferences, using the FEA consumer needs model.

2. To measure the extent to which Saudi female academics are willing to wear cultural ethnic dress visually related to the tribal area in which they live, in this time period that is influenced by standardized western clothing in the global marketplace.

3. To measure the extent to which Saudi female academics would be willing to pay for a culturally inspired form of professional dress.

4. To measure the extent to which Saudi female academics would value hand embroidery in this era of technology.

Contribution to the Apparel and Merchandising Field

This research could potentially provide greater understanding of the ethnic culture of the western province in Saudi Arabia for Western scholars. Findings from this research may help provide justification for the support of potential small business opportunities for Saudi women who are qualified to work in the apparel industry. In addition, the FEA consumers' needs model

(Lamb & Kallal, 1992) used in combination with the modified participatory design model (Demirbilek, & Demirkan, 2004) of the study could be useful in other product development endeavors, such as apparel accessories within academia or for other intended consumers and/or cultures.

Limitations

- Co-designers or participants were only included in the first and final phases of the design process due to the long distance separating the researcher and the co-designers.
- Wear-testing of the finished garments in the final phase was not possible because the garments were made in a small size.
- Preferences are highly different from one individual to another; therefore, results cannot be generalized to all faculty members in departments of clothing and textiles. In addition, results cannot be generalized to all faculty members who work in apparel design departments in Jeddah.
- Textiles could not be printed in various fabrics or fabrics with blended fiber content to provide more opportunity for ease-of-care laundering.

Definitions and Terms

Abaya: "A simple, loose over-garment, essentially a robe-like dress, worn by some women in parts of the Islamic world that covers all of the clothes underneath except the face, feet, and hands (Long, 2005; Topham et al., 1981). It can be worn over the head or over the shoulders with a headscarf. The Abaya can be simple for everyday or fancy for special occasions, usually in

black color and sometimes decorated with either black or colored embroidery for festival occasions" (Anawalt, 2007; Long, 2005; Stillman, 2000;Topham et al., 1982).

An academic: "A person who works as a teacher in a college or university" (Merriam-Webster's, n.d.).

Dikka: "A long strip of fabric that is folded and inserted in the waist of the pants and tied from the front based on the waist size" (Topham, et al., 1981).

Ethnic dress: Attire characteristic of a specific language, religion, and ethnographic social group and may be worn by diasporic people who retain allegiance to their cultural heritage (Maynard, 2004); it is also called traditional dress which personifies the traditions preserving and providing cultural heritage as a valuable thing via clothing items and any modifications of the body (Eicher & Sumberg, 1995; Iskandrani, 2006); "this dress could be considered as costume because it is unchanging and determines cultural diversity within culture comparison (Craik, 1994).

Hejaz: The Western region of Saudi Arabia including the west coast. There is a mountain range (with peaks rising to 3,000 meters) running south to north, decreasing gradually in elevation as it moves northward, and the coastal plain bordering the Red Sea. The word Hejaz means "barrier", and refers to the huge escarpment that runs from north to south shaping a natural corridor (Ross, 1981).

Hijab: The hijab is comprised of a veil to cover a woman's hair and neck (Guindi, 1999; Topham et al., 1981). The term hijab is also used to describe the modest style of clothing or dressing that a Muslim woman might wear in countries that do not require wearing an Abaya, while traveling in Europe or the United States for instance.

Professional attire: "Clothing of a distinctive style that is suitable for a profession such as lawyers, doctors, and other professional people" (Merriam-Webster's, n.d.).

Serwal: "Baggy pants with narrow cuffs decorated with embroidery and gathered at the waist by a drawstring dikka" (Topham et al., 1982). Typically these pants are worn under a long dress or Thawb.

Sidaireeya: A high collared, waist–length bodice with elbow-length sleeves that takes the place of a brassiere, when worn with the V-necked zabun. The Mandarin collar and sleeve edges are generally frilled or edged with embroidery. The front opening is buttoned high on the neck with removable buttons, and is traditionally made of fine, pure cotton, often eyeleted and embroidered (Ross, 1981).

Thawb or Jallabya: "Refers to men's and women's basic dress in Arab countries. It is a standard floor-length dress varying little throughout Arabia (Topham et al., 1982). The Thawb is constructed from several pieces of fabric with openings down the sides. Necklines are simple, consisting of a small round hole and a narrow opening down the front. Sleeves are either long and narrow or wide-winged. This last type of sleeve is also found in Palestine, Syria and Iraq, but the Arabian versions worn in Ta'if and the Asir have square rather than sharply pointed ends, hanging down to the hem of the dress. When working, the women draw up these sleeves and tie them behind the neck (Ross, 1981). The absence of curved cutting or use of the bias grain was compensated for by the use of underarm gussets" (Kennett, 1995; Ross, 1981).

Western dress: Post-modern dress, sometimes controversially defined as global dress which obtains its style from multiple cultures (Kaiser, 1997). For the purposes of this study, Western dress is defined as American and European style of dress.

Zabun: A dress for urban Hejazi women. This dress has a collar, and it is common for Zabun to allow shaping along the center-front opening (Labban, 1990; Ross, 1981; Yamani, 1997).

CHAPTER II

REVIEW OF LITERATURE

The literature review describes Hejazi ethnic dress (which includes ethnic Hejazi embroidery in women's dress) in order to translate some design elements into modern professional academic dress. It also explores Saudi women's preferences in workplace attire. These descriptions are underpinned by the Functional, Expressive, and Aesthetic (FEA) design model as a framework (Lamb & Kallal, 1992). Because the intent was to engage female academics in the design process, there was exploration on how a collaborative design approach could be combined with the FEA design model.

Cultural Background of Female Ethnic Dress in Hejaz

The geographic focus of this research was situated in the Western province of Saudi Arabia, located in Hejaz. This area is known for the Port of Jeddah, a flourishing commercial center. The Hejaz is a land of great variety; its vast dry deserts contrast sharply with the cultivated areas. To the southwest toward the coast, lies the Tihama, or lowland area of the Hejaz (Ross, 1981, p. 86). In this province, about two million people come from all corners of the globe annually to visit the holy Islamic cities, Makkah and Medina. These two cities were the starting place of the prophet Mohammed and his enlightenment, and early on they evolved into centers of genuine Arabic urban culture (Long, 2005; Stacy, 1980; Yamani, 2004).

Jeddah city, as a coastal area of the Western province, is known for its humid weather. In summer, the temperatures reach above 40 degrees Celsius. The impact of the temperature and humidity has influenced the development of loose clothing styles and implies a necessity for

cotton and other absorbent natural fiber textiles to enhance wearer comfort during summer (Gillow, 2010).

From a commercial and educational aspect, Jeddah city in Hejaz was an early center for formal and non-formal education after the holy cities Makkah and Medina in the Hejaz region. In fact, to this day a very large number of people come every year to Makkah for pilgrimage and to Medina for visiting the prophet Mohammed, through the commercial coastal city of Jeddah because it has one of the few international airports in Saudi Arabia (Stacy, 1980).

Men and women used to have similar primary items of clothing in Arabia before Islam. These items included a long T-shape dress which was knee- or ankle-length, and Sirwal, a trouser-like undergarment (Gillow, 2010; Scarce, 2003; Stillman, 2000). Over these items they used to wear a loose-sleeved cloak when in public; both men and women also wore shoes or sandals and a head cover (Gillow, 2010). Arabian women used to wear large turbans on their heads, dresses and large shawls. Etchings show turbaned women walking in public with long braids falling down their backs from beneath their head covers (Hassan, 2001; Ross, 1981). Wearing the head cover for both Arabic men and women was an expression of prestige and dignity, as well as for protective and aesthetic aspects (Al-Babtain, n.d.; Lewis, 2007) (See figures 2.1 & 2.2).
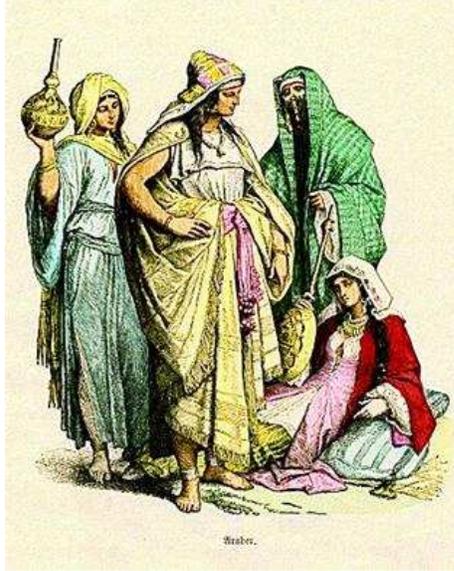
Figure 1.1: Costumes of Arab Women, Fourth to Sixth Century. Retrieved from
http://www.siue.edu/COSTUMES/PLATE8CX.HTML

Figure 2.2: Costumes of Women in the Arab World During the Late 19th Century. Retrieved
from http://www.siue.edu/COSTUMES/history.html

Women in Arabia used to wear Thawbs which were all of a similar basic style that

included flaring side panels and under-arm gussets (Al-babtain, n.d.; Fairservis, 1971; Kennett,

1995). However, this Thawb had many variations in generosity of cut, choice of fabrics as well

as colors, patterns and embellishment techniques used. Sometimes these differences were an

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aspect of the geographic or climatic conditions, and/or the position or prestigious status in society of the wearer (Al-Babtain, n.d.; Iskandarani, 2006; Long, 2005; Ross, 1981; Yamani, 2004). Serwal pants that were embroidered at the bottom cuffs, with similar stitches to the thawb but in different patterns, were the other component of the dress (Kennett, 1995; Stillman, 2000). When in public, Arabian women wore an outer garment that covered their bodies, and often their faces were covered too (Al-Babtain, n.d.; Anawalt, 2007; Sorber, 2001; Stillman, 2000).

In the seventh century, Islam was born in the Middle East with its dress code; this dress code added some additional requirements for modesty to the pre-Islamic era (Al Jahiliyya, n.d.), during which some women used to uncover their hair, necks, and chests and overdress in public (Afifi; 1982; Al-Babtain; Long, 2005; Topham et al., 1981). Since the birth of Islam, Arabian Muslim female dress has maintained the Islamic norms of modesty, although with variations of styles (Kennett, 1995).

Even though Saudi Arabia is considered one of a few countries that has retained its traditional dress styles, changes in this dress have been evolving (Long, 2005; Topham et al., 1982). These variations have occurred in modern times based on various geographic regions, and influence the cut, styles, and names of the various garments as well (Long, 2005). However, there are some words that have generally understood meanings across Saudi Arabia. For example, Thawb could be understood not only in the Hejaz but also in Najd, Eastern province, Asir, and the Northern Province and beyond Arabic countries.

Today, although many Saudi women continue to wear ethnic dress (Thawbs) for festive occasions, in private situations most wear Western style clothing, particularly in urban areas (Anawalt, 2007; Eacher & Sumberg, 1995; Iskandarani, 2006; Long, 2005; Rabolt & Forney,

1989). Also for most work-related situations, younger Saudi women and those who travel wear Western clothing under their Abaya in public situations (Anawalt, 2007).

Traditional Tribal Women's Dress

Occupants of the Arabian Peninsula are known as Arabs (Anawalt, 2007), and the *nomadic* people in the Arabian Desert and mountains are known as "Bedouins" (Yarwood, 1978). The Bedouin ethnic tribal dress used the same design elements as the Arab dress, which included a head wrap, a principle shirt, and Sirwal pants under the long Thawb as garments beneath the Abaya outer cloak (Anawalt, 2007; Sorber, 2001; Stillman, 2000; Topham et al., 1981). In addition, the Bedouin tribal dress incorporated a lot of jewelry and embroidery (Yarwood, 1978).

Tribal Hejazi women's Thawbs have brightly colored embellishment, including embroidery and appliqué, especially on their veils and head wraps; this embellishment distinguishes Tribal female dress from male dress and represents regional variation (Kennitte, 1995; Ross, 1981; Topham et al., 1982). Women employed appliqué as sleeve cuff trimming and for sleeve godets, which were the triangular inserts used as decoration and which create a flared effect (Gillow, 2010; Topham et al., 1982). Tribal Hejazi women embellished their Thawbs with heavy embroidery in particular locations of front opening, side panels, sleeve edges, and hem. Embellishment colors varied from region to region, but mainly were reds of all shades, oranges, and greens (Kenntitt, 1995; Topham et al., 1982). Tribal women wove only wool in the Arabian Peninsula; silk, cottons, velvets, voiles, and satin were imported from Persia, India, and other neighboring countries (Gillow, 2010; Topham et al., 1982).

According to Gillow (2010), "The tradition of highly decorative women's costume is especially strong in the Hejaz" (p. 125). In Hejazi rural (non-nomadic) women's Thawbs, there was a frequency of brightly colored appliqué patches. These patches were often a rose red color and sometimes were blue, used as stripes on the Thawbs, which were made of black twill, or a patterned fabric (Gillow, 2010; Paine, 2008; Ross, 1981).

Bedouin tribal women wore heavily embroidered Thawbs that had various widths of sleeves with loose square ends which were tied to the back when women were working (Gillow, 2010). The sleeves attached to an under-arm gusset that was joined to side panels which radiated to the hemline. Along with the allowance for ease under the arm, the gusset was purposefully added for an aesthetic reason (Ross, 1981). The gusset was one of the design elements of Arabian women's dress that often was embellished with contrast-colored fabric.

Underneath their Thawbs, both rural and tribal women also wore matching Serwal pants that had a drawstring at the waist and fitted cuffs with similar embroidery to the sleeves of the Thawb (Long, 2005; Ross, 1981; Topham et al., 1982). The Sirwal design would accommodate a pregnant as well as a non-pregnant body. This set of clothes was usually created from a dark, single-colored fabric such as black or burgundy (See Figures 2.3, 2.4, 2.5, 2.6, & 2.7). They were also made of cotton, calico, satin, or velvet. Hejazi tribal women wore black head coverings, and many covered their faces with either facemasks or simple black veils as well.

Figure 2.3:   An Example of the Tribal Bani Sulaim Thawb in Hejaz. Retrieved from Topham, P., Landreau, A., & Mulligan, W. E. (1982). Traditional crafts of Saudi Arabia. Sugar Land, TX: Stacey Intl.

Figure 2.4:   An Example of the Tribal Harb Thawb in Hejaz. Retrieved from Topham, P., Landreau, A., & Mulligan, W. E. (1982). Traditional crafts of Saudi Arabia. Sugar Land, TX: Stacey Intl.
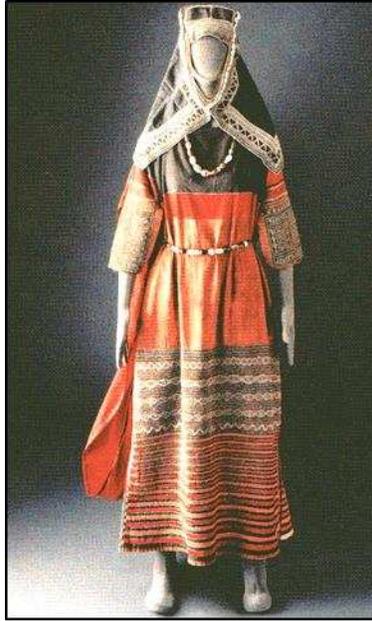
Figure 2.5:   An Example of the Tribal Al Jahdaly Thawb in Hejaz. Retrieved from Topham, P., Landreau, A., & Mulligan, W. E. (1982). Traditional crafts of Saudi Arabia. Sugar Land, TX: Stacey Intl.
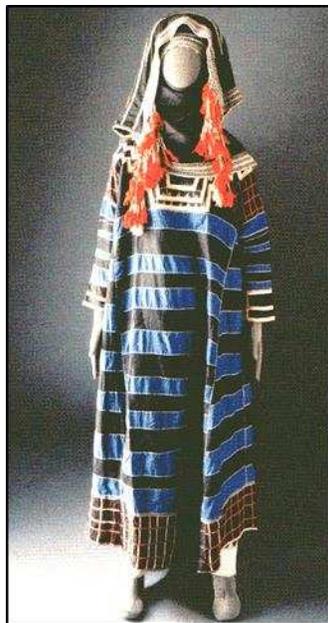
Figure 2.6:   An Example of the Tribal Bani Thaqeef Thawb in Hejaz. Retrieved from Topham, P., Landreau, A., & Mulligan, W. E. (1982). Traditional crafts of Saudi Arabia. Sugar Land, TX: Stacey Intl.

Figure 2.7: An Example of the Tribal Bani Sa'ad Thawb in Hejaz. Retrieved from Topham, P.,
Landreau, A., & Mulligan, W. E. (1982). Traditional crafts of Saudi Arabia. Sugar Land,
TX: Stacey Intl.

Traditional Urban Women's Dress in Hejaz

The Ottoman Empire in the 19th century influenced urban dress styles in the Hejaz
region (Ross, 1982; Yamani, 2004). Urban Hejazi women used to wear Thawbs and a three-piece
head cover over the head. And in public, they covered their inner garments with an Abaya long
outer cloak-like robe (Long, 2005; Yamani, 2004). During this time it was common for many
upper-class urban women to uncover their faces (Long, 2005).

From the 19th century until the present, the Zabun dress garment has been one of the
components of townswomen's attire (See Figure 2.8) (Labban, 1990; Ross, 1981; Yamani,
2004). Zabun has a collar, and has shaping along the center-front opening (Labban, 1990; Ross,
1981; Yamani, 2004). The embellished Serwal pants received great consideration in urban Hejazi
female dress because they were visible when worn under the sheer Thawb (Labban, 1990; Ross,

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1981). In that time the urban woman's sheer Thawb included gold work. In present times, urban women wear modest garments which are Western styles of commercial dresses under the Abaya when in public (Paine, 2008).

Figure 2.8: An Example of the Traditional Dress for Hejazi Urban Women. Retrieved from http://www.saudiembassy.or.jp/DiscoverSA/TC.htm

In research investigating the contemporary Saudi Arabian women's dress in which the authors collected data from Saudi women who lived in a major Saudi city, Rabolt and Forney (1989) found that today the Abaya and the veil are worn and preferred by Saudi women because of religion and tradition, and to a lesser extent protection. In addition, based on the level of traditional versus Western dress worn in certain situations, there is very different representation of dress depending on the level of privacy within the situation. In public situations and when men were present, the subjects in their research wore traditional garments. While in private situations and when women only were present, less traditional or more Western dress was worn. In private as well as professional situations more Western dress is worn by those who are younger, have traveled, and who work outside the home (Rabolt & Forney, 1989).

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Characteristic Aesthetic Appearance of Ethnic Embroidery in Hejaz

Today, traditional Hejazi female dress is embellished with a variety of materials, textures, and techniques. Thawbs from tribal Hejaz are embellished with appliqué strips of multicolored material. Other Thawbs are embellished with colored glass beads, mother-of-pearl buttons, lead beads on the cuffs, and a variety of coins. Thawbs can also be embellished with metallic silk or rayon thread embroidery on different spots such as the shoulder, seams, and side panels. Different hand embroidery stitches are used such as chain and stem stich.

Embroidery Placement

In Hejazi women's Thawbs, embroidery is usually located on sleeve cuffs, front neckline opening, bodice, hems, and sometimes stitches extended down from the waist (Anawalt, 2005; Long, 2005; Ross, 1981). Also, embroidery is placed at side seams, side panels, and shoulders (Ross, 1981; Topham et al., 1981). In addition, embroidery can be placed on the front vertically, or on the bat-wing sleeves (Nasr, 1996; Paine, 2008), and on Serwal pant cuffs which match embroidery on the sleeves (Anawalt, 2007; Long, 2005).

Embroidery Stitches

Chain stitches are used in Hejazi women's Thawbs (Long, 2005; Paine, 2008; Ross, 1981; Topham et al., 1982). In addition, stem stitches, flat stitches, cross or half-cross stitches, couching and buttonhole stitch, and strips of appliqué are used in their Thawbs (Kennitte, 1995) (See Table 2.1). Other stitches such as open chain stitches, cretan stitches, long-arm feather stitches, ladder stitches, blanket stitches, dotting or seeding, fly stitches, waves or chevrons, and spider's webs are seen in tribal women's dress (Ross, 1981; Topham et al., 1981). On the other

hand, oiyas (crocheted edge trim) are seen in urban dress particularly on headscarves used for hijab.

Table 2.1: Hejazi Embroidery Stitches. Ross, H. C. (1981). The art of Arabian costume: A Saudi Arabian profile. Fribourg, Switzerland: Arabesque Commercial SA.

Stitch	Illustration
Stem	
Chain	
Bedouin Pinnacle (Spider's Web) *Gob'a* stitch	
Wave	
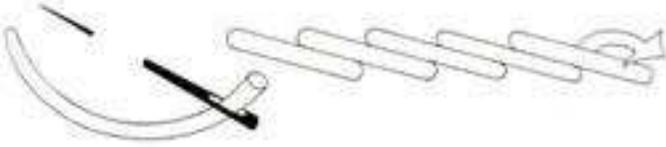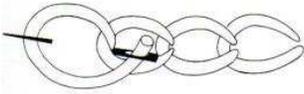
Bedouin *Waahed* (Open Chain or Ladder)	
Bedouin *Arbaa* (Threaded Fly)	
Feather	
Blanket	
Black	
Cross	
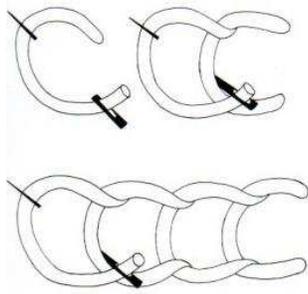
Half-Cross	
Flat	
Cretan	
Dotting or Seeding	
Couching	

Oya Crochet used as an edge finish	
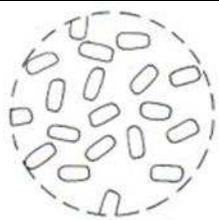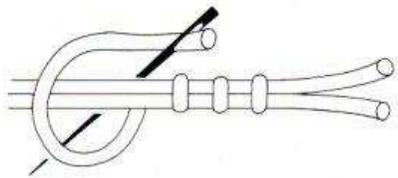
Embroidery Patterns and Motifs

In Islamic law, there is prohibition of any representation of the human form in art which has led to the emergence of abstract embroidery patterns including the use of geometric cross-stitch work on women's garments, especially the tribal women (Al mufti, 1997). Generally, Arabic women use embroidery in floral and geometric designs for embellishing their Thawbs as inner clothing beneath the Abaya, but not for outer clothing. Embroidery is most commonly used for special occasion clothing, and is not commonly used for professional attire (Almofti, 1997; Fairservis, 1971; Nasr, 1996; Ross, 1981). Hejazi women use botanical, arabesque, leaf, flower, animal, and palm tree motifs in their Thawbs (Ross, 1981). Also, web stitches similar to spider webs, loops, triangles, polygons, and squares are used (Almofti, 1997). Most Arabic artists create patterns based on religious motifs, climate, and plants. In addition, Arabian tribes use motifs to distinguish identity between tribal groups (Gillow, 2010; Ross, 1981) (See Figure 3.2).

Embroidery Materials

Hejazi women use a variety of materials to embellish their Thawbs. They use silver bells for head coverings (Long, 2005). They also use beads (Anawalt, 2007), buttons, sequins, coins, silver plated thread (Gillow, 2010; Paine, 2008; Ross, 1981), mother-of-pearl buttons, gemstones, and metal. Urban women use kanteel and talle metallic threads for embroidery (Nasr, 1996; Topham, 1981).

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Embroidery Threads

In Saudi Arabia and the Gulf States, wool was replaced by sheer cotton, and the simple wool reinforcing stitches at the neckline and over the arms were replaced with elaborate gold embroidery (Sorber, 2001). Women's Hejazi Thawbs were embroidered with metallic gold and silver threads (Anawalt, 2007; Long, 2005; Paine, 2008; Ross, 1981) as well as metallic silk, rayon, or cotton thread (Topham et al., 1981). Hejazi urban women embellish their Thawbs with Talli, which is gold or silver wire brought from India to decorate edges of Thawbs (Nasr, 1996; Ross, 1981). Tribal women embellish their Thawbs with colored threads in white, pale yellow, and vivid parrot green usually placed on a dark background (Gillow, 2010; Ross, 1981).

Embroidery and Embellishing Symbolism

In traditional Arab dress, the neckline of the clothes is embroidered because it is believed that this will protect the wearer from evil spirits (Al-Mofti, 1997; Ross, 1981). Ross (1981) adds that women in many parts of the Middle East used to have red and blue colors predominate in their garments because these colors have "protective properties." According to Rivers (1999), "tribal style dark-colored Thawbs were embellished with saw tooth-edged embroidery and shiny coin-shaped disks which were believed to prevent harm, such as bad luck or infertility; protective elements were intentionally placed to protect the neck, chest, and reproductive organs" (p. 88). Arabic Islamic aesthetic does not maintain any empty space in the design work because it is believed that goodness should cover every space; otherwise emptiness would be related to evil (Al-Mufti, 1997).

Saudi Professional Women's Dress Preferences

What Saudi female working women look for in their workplace attire is about the same as working women in the West. Saudi academic professional women look for clothes that are between formal and casual, and they also aim to balance the formality of professional dress alongside a woman's need to look stylish and unique (Green, 2001; Kaiser et al., 2001). Basically, comfort is the first priority for working women when they buy workplace attire (Green, 2001).

Academia is considered to be an interactive environment where faculty share different roles such as instructing, organizing, or managing, and have different perspectives as a consequence of diverse areas of specialization. According to the dress code in Saudi universities, female faculty members can wear ensembles with one, two, or multiple pieces that should be long enough to cover the arms with long sleeves not shorter than the elbow. The pants should be loose. It is proposed that Saudi female academics might be amenable to wearing professional attire inspired by some design elements of the tribal Hijazi ethnic embroidery.

Some empirical studies have been conducted regarding the functional, expressive, and aesthetic design criteria of working dress in Jeddah and Makkah cities in Hejaz within the Arabic language research literature. In a quantitative study investigating working women in Makkah concerning their preferences for workplace dress, the researcher suggested that there needed to be clothing factories in Saudi Arabia that considered functional and aesthetic aspects, along with considering culture and price (Al-Amoudi, 1994).

In the functional realm, researchers found that in the Mekkah area (which includes Jeddah), where the dominant weather in the year is hot, working women preferred cool natural fabrics such as cotton and linen that have characteristics of maintaining a good appearance of the garments for long hours (Al-Amoudi, 1994; Bark, 1987; Turkustani, 1995). Bark (1987) found that Saudi women's workplace dress should be simple, and that the designs should consider the functional aspect in terms of fitting different environments of workplace and periods of work. The set of a two-piece working outfit was considered advantageous (Bark, 1987; Turkustani, 1995). Also in the study by Turkustani (1995), the researcher found that with the social and technological changes in Saudi Arabia, Saudi working women have become more interested in simple dress rather that heavily decorated dress considering durability and ease of laundering. Saudi working women have adopted modern Western dress styles that function well for various activities in the workplace environments, while maintaining the aesthetic aspects reflecting their prestige in society, as an expressive aspect of dress.

Because this research pertained to a particular group in a particular part of Saudi Arabia, knowing participants' preferences and responses regarding FEA and culture was essential. According to Eckman, Takagi, and Tremblay (2012), there are obvious individual differences in aesthetic preferences of consumers, and they found that consumer's nationality influenced the aesthetic preferences for textiles. In addition, the researchers supported the understanding of general aesthetic preferences for textiles. The researchers also confirmed that this understanding could help local companies to provide products that satisfied the needs of their target markets (Eckman, et al., 2012; Yoo, 2003). Yoo (2003) stated that apparel companies needed to investigate consumer personal characteristics (i.e., age and ethnicity) and their interrelationships, which directly influenced their individual design preferences. Yoo (2003) also confirmed the

importance of further investigation by exploring ethnicity as one of the major consumer variables that frame each ethnic group.

Theoretical Framework

FEA Design Model

The founders of the conceptual apparel design framework (Lamb & Kallal, 1992) investigated apparel requirements for consumers with special needs. In fact, they revealed that they were seeking a framework that was so general that it could be applied when designing apparel for any consumer, including a consumer whose needs are not often met in the apparel market. They proposed that this framework would be applicable to any apparel design project because it handles functional apparel design as if it were fashion design. The crux of the FEA framework is a model of consumer needs that guides the development of design criteria for various types of customers (see Figure 2.9).
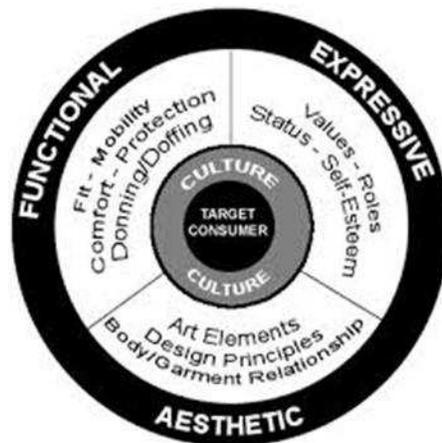
Figure 2.9: FEA Consumer Needs Model (Lamb & Kallal, 1992)

According to the FEA founders Lamb and Kallal (1992), before designers can analyze consumers' needs, they must develop a profile of the user because the consumer (intended user) is at the core of the model. This analysis includes investigating user requirements considering the environment of a use-situation. Culture surrounds the consumer in this model and it mediates between the consumers and their needs in the specific apparel pieces. When resolving design problems, culture has an effect on consumer decisions when it comes to choosing the most acceptable items.

Lamb and Kallal (1992) also posit that by identifying user requirements, the designer would be able to contextualize the design criteria which are classified in this model as functional, expressive, and aesthetic. These criteria could be adapted to suit different consumers. Functional aspects for an apparel item are related to how the outfit would be worn or used by a specific consumer. This usefulness would include comfort, protection, thermal capacity, fit, and ease of movement. Expressive aspects are related to how the outfit would express communicative and symbolic parts of the garments and/or aspects of the wearer, because apparel consumers often utilize garments as a means to convey a particular personal message for interpretation by others (Barnes and Eicher, 1992). The aesthetic aspects address to what extent the garment is perceived as beautiful by the wearer or other observers. Aesthetic aspects in the apparel items are related to the design elements (line, color, texture, form and, pattern) in order to develop a likeable design.

The three aspects of dress that need to be considered in the design process are interrelated in several ways for various intended consumers. The functional - expressive connection represents how apparel could be useful along with conveying a personal message about the wearer. The expressive - aesthetic connects aspects related to the message conveyed by apparel and how the beauty of the garment could enable a wearer to obtain pleasure from wearing it. In

terms of the aesthetic - functional connection, the standard is how the garment could be beautiful and still successfully meet the particular purposes. In their research, Lamb and Kallal (1992) provided some project examples in which garments were designed to fulfill the functional, expressive, and aesthetic requirements of specific consumers in various contexts such as costumes for ice-skating, uniforms for clean rooms, and acustomized garment for a consumer with Spina Bifida.

For the purposes of an ice-skating competition, the FEA model (Lamb & Kallal, 1992) was used to develop profiles of the skaters considering sport regulations and situational needs. The following FEA characteristics were determined within the functional aspect. The silhouette of the garment had to be closely fitted on the wearer; at the same time, the garment should allow freedom of movement. Also, comfort was required of the garments, so the fabric should not cause an itchy sensation. The expressive aspects of dress were also considered. For example, garments had to have non-verbal symbolic signs that conveyed to the audience a message with clarity, universality, and steadiness. In terms of the aesthetic manipulation, the garments should maximize the beauty of the body look or shape. The garments needed to have colors and visual design elements that matched the theme of the program in the ice arena setting. The assessment process of the garments was underpinned by the former FEA criteria, as a standard, which was tailored for the skating garments (Lamb & Kallal, 1992).

Another project that applied the FEA design model involved a company that ordered uniforms for dust-free work rooms in the computer industry, which would help humanize and improve the work environment. The consumers were engineers and employees in the company. Designers learned more about the work situation by related readings and video tapes; then, they contextualized the requirements of the uniforms based on the functional, aesthetic, and

expressive aspects of the design project. The uniforms needed to fit over the wearer's regular clothes, and ease of movement and durability of the garments were some of the required functional characteristics. Regarding the expressive criteria, garments needed to express the wearer's self-respect, personality, and group unity. Within the aesthetic realm, enhancing male and female body structure with good design was an important need. There was also a cultural limitation for color options, in that male employees were reluctant to wear pink. The evaluation of the uniform designs was measured against the criteria that were developed in the primary steps of the design process (Lamb & Kallal, 1992).

The last project presented in the study was conducted by the founders of the FEA design model, Lamb and Kallal (1992), in which they customized a garment for a consumer who had Spina Bifida. The female student requested a stylish two-piece pants ensemble. Using interview and observations, the authors made a profile of their consumer. This profile included information about the consumer such as her physical characteristics, her negative response toward the fit and fashion of ready-to-wear garments, and her interests and activities. At this point, the authors situated the consumer's FEA needs. The student needed a comfortable outfit that allowed her ease of movement, in terms of the functional aspects of the garment. Her expressive requirements were in wearing an outfit that represented her uniqueness but was also trendy and appropriate for her age. From the aesthetic perspective, she needed an outfit that looked attractive. Fortunately, the finished garment fulfilled the design criteria developed for the consumer and she was pleased by the attractive result.

The FEA consumer needs model in this research provided appropriate foundation and worked as a reasonable framework in analyzing the culture of the female academics, as intended consumers working in King Abdul-Aziz University in Jeddah. It was used to contextualize the

characteristics of Saudi ethnic dress for women, and to describe the characteristic aesthetic appearance of ethnic embroidery in the Hejaz. Moreover, utilizing this model, the functional, expressive, and aesthetic preferences of dress for working women in Saudi Arabia was able to be described. The FEA consumer needs model also guided the process within the collaborative design approach.

Collaborative Design Model

According to Sanders and Stappers (2008), designers have been moving increasingly closer to future users of what they design, and the next new thing in the changing landscape of design research has become co-designing with your users. The evolution in design research from a user-centered approach to co-designing is changing the roles of the designer, the researcher, and the person formerly known as the user. This change in design research is manifesting new domains of collective creativity. It is hoped that this evolution will support a transformation toward more sustainable ways of living in the future. Designers are becoming moderators for consumers, rather than experts in design ideation. In order for participatory design to be successful, one must believe that all people are creative, and have valuable input.

Collaborative design is the process of involving consumers in co-creating a product, which combines individual consumer's needs with a company's pre-designed specifications. The co-design process allows individual consumers to customize a product to meet their needs more precisely while allowing near mass-production efficiencies in production (Binder, Brandt, & Gregory, 2008; Sanders, 2002; Wu, 2010). This approach refers to the collective creativity of collaborating designers (Wu, 2010). It is a shift in attitude from designing *for* users to one of designing *with* users. It is a new design movement that requires new ways of thinking, feeling,

and working. Participatory experience is not simply a method or set of methodologies, it is a mindset and an attitude about people. It is the belief that all people have something to offer to the design process and that they can be both articulate and creative when given appropriate tools with which to express themselves (Sanders, 2002; Sanders & Stappers, 2008). Especially in areas where technologies mature, and the next new feature is no longer of value, manufacturing companies have become increasingly open to approaches that define the product based on what people need.

Binder et al. (2008) found that collaborative design affected a reorientation of how relations between design and use were conceived. Instead of artificial intelligence, situated action was required, and instead of a model of the designer as rational planner, the designer was reframed as a reflective practitioner. According to Sanders (2002), success in collaborative design depends on level of expertise, passion, and creativity of the 'user'. In fact, if people's experiences can be accessed (past, current, and potential), then user experience can become a source of inspiration and ideation for design.

In the classical user-centered design process, the user is a passive object of study, and the researcher brings knowledge from theories and develops more knowledge through observation and interviews. The designer then passively receives this knowledge in the form of a report and adds an understanding of technology and the creative thinking needed to generate ideas, concepts, etc. In collaborative design, the roles get mixed up; the person who will eventually be served through the design process is given the position of expert of his/her experience and plays a large role in knowledge development, idea generation, and concept development.

Morris (2011) conducted research that combined co-design and FEA consumer needs design models, along with the product development model. She found that with co-design, she benefited from the immediate feedback of the consumers, who were the potential end users. She also found that she obtained information from consumers that would be otherwise costly to obtain. In addition, she benefited from being certain about the product concepts and was able to produce more on-point products based on the input of the users as resources.

There are several issues identified as problematic in design processes where novices (i.e., people not trained in design) participate. One is that too much time is spent on one early idea instead of exploring many possibilities. Another is that it can be difficult to get people to create ideas when they feel that they have insufficient knowledge. A third problem is that people who are brought into co–designing experiences may feel that they are not creative (Sanders, 2011).

Collaborative design studies strive for codetermination of the project by designers and users. Specific project criteria are co-determined by designers and users during the project. This way, designers do not take total ownership of the project; users are also able to shape projects to reflect their values, goals, and ends (Spinuzzi, 2005).

While there is an overall linear order to the design process (from understanding users' needs to designing a product to meet those needs), it is important to keep in mind that it is also an iterative process, and it is difficult to proceed in a strictly linear order when using participatory design. The designer's goal is to understand how the users think and feel about the products.

Considering the significant role of the consumer and their effect in collaborative design, a model titled Usability, Safety, and Attractiveness Participatory Design (USAPD) was modified to enable female academics to participate in the design process. (Demirbilek & Demirkan, 2004). With this approach, the creativity of the product may be enhanced, as well as more successfully meet their needs for unique professional attire for the workplace. In addition, the participants in this study are academic professionals who teach and practice design (see Figure 2.10).
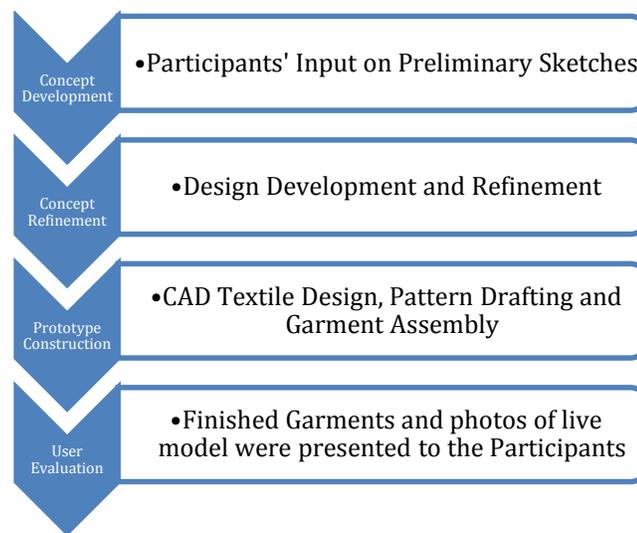
Figure 2.10: The Adapted Collaborative Design Model

Summary

There is a lack of research which describes professional clothing for women in Saudi Arabia that includes ethnic design influence. This may be because professional dress is usually associated with relatively neutral colors, which are not consistent with the vivid colors and preponderance of embellished patterning in most types of Saudi ethnic dress. In addition, usually ethnic dress has silhouette, line, and decorative embroidery designs that are not practical for

wearing in the workplace. Some examples of the impracticality of ethnic designs are the very wide sleeves, few openings in the dress, and many trimmings and hand embroidery on each piece of clothing. In addition, from an expressive perspective, some professional women might think that the design of ethnic dress does not provide the desired look of educated professionalism when perceived by observers, compared to Western contemporary designs for female professional dress. Perhaps this is because the existence of professionalism among women in Saudi Arabia is a phenomenon associated with Western influence.

There is a need for additional research to study the contemporary usage of Hejazi ethnic women's dress and embroidery. Also, it has been recommended to conduct more empirical studies that are oriented toward women's preferences and aesthetic and functional evaluation of the ethnic dress of the workplace attire (Al-Amoudi, 1994; Bark, 1987; Turkustani, 1995). In addition, exploring ethnic preferences as one of the main consumer variables for female academics will build on existing knowledge (Takagi et al., 2012). Investigating Saudi women's responses to new approaches to designs that blend an ethnic aesthetic from the traditional thawb with western fashion would contribute to consumer behavior literature.

Most references associated with Hejazi women's ethnic dress have provided adequate contextual information about identifying embroidery of the ethnic women's dress in Hejaz (Anawalt, 2007; Gillow, 2010; Ross, 1981; Topham et al., 1982). In terms of consistency, there is agreement on the general description or definition of the types of embroidery in Hejazi dress in most references, even though they are not empirical studies. On the other hand, few empirical studies regarding the identification or the typology of embroidery in Hejazi women ethnic dress have been conducted (Khogeer, 2005). Few studies have been conducted regarding the illustration of stitches used in Hejazi ethnic dress (Ross, 1981). Also, there is a lack of references

in the literature related to the contemporary professional dress in Saudi Arabia generally and in Hejaz specifically.

By conducting a study that investigates Hejazi female academics' preferences in professional attire which has inspiration from traditional ethnic design elements, a data-based research endeavor could then implement those preferences into a product line. This research focused on closing a gap that exists in which Hejazi female academics wear ethnic dress during special occasions, and while potentially they could demonstrate a relationship with their own ethnic aesthetic culture of dress in the academic workplace, they do not because they have the convenient and practical alternative designs of Western styles that are available in the Saudi market and fit their nature of work. This project was intended to fill this gap by creating ethnic dress to be worn by Saudi women as everyday workplace attire by providing designs that are relatively practical, affordable, available in the Saudi market, and more expressive of Saudi aesthetic cultural identity. The study employs a collaborative design approach, which seeks to involve co-designers and/or end-users in the design process, to better ensure that the designs meet the functional, aesthetic, and expressive needs of the user.

CHAPTER III

METHODS AND PROCEDURES

The purpose of this data-based research was to create a collection of professional dress ensembles for Saudi female academics using CAD technology for textile design and printing, pattern drafting, and apparel illustration. The textile and apparel designs were inspired by ethnic embroidery of the Hejaz (Western province of Saudi Arabia).

The following research questions guided the research endeavor:

- Was it possible to combine traditional Hejazi embroidery patterns with digital printing technology?

- Would Saudi female academic professionals in Jeddah be interested in wearing professional attire that has ethnic-inspired, CAD printed fabric embellished with hand embroidery in comparison to their usual work attire?

The research was designed to accomplish the following objectives:

1. Produce a collection of professional attire that had Hejazi-inspired, CAD printed fabric embellished with hand embroidery for Saudi female academics, and to evaluate the collection based on their FEA preferences, using the FEA consumer needs model.

2. Measure the extent to which Saudi female academics would be willing to pay for a culturally inspired form of professional dress.

3. Measure the extent to which Saudi female academics are willing to wear cultural ethnic dress visually related to the tribal area in which they live, in this time period that is influenced by standardized western clothing in the global marketplace.

4. Measure the extent to which Saudi female academics would value hand embroidery in this era of technology.

<center>The Collaborative Design Process</center>

For the purpose of the collaborative design process in this study, an adaptation of a participatory design model was proposed in order to design and develop professional work outfits that would meet Saudi female academics' functional, aesthetic, and expressive needs. This model consists of four phases and was modified from the Usability, Safety, and Attractiveness Participatory Design model (USAP) in order to transform a concept into a design description so that the products or garments would be capable of producing the determined functions (Demirbilek & Demirkan, 2004).

The adapted USAP model guided the design process considering FEA preferences of Saudi working women for their workplace attire (Al-Amoudi 1994; Bark, 1987; Turkustani, 1990). The modified participatory design process used in this study is described in the following section.

Concept Development Phase

Inspiration

Embroidery in the Hejaz has been given significant care, especially by women in the tribal areas. Tribal Hejazi women based their embroidery motifs, patterns, materials and colors form the surrounding environment. Likewise, as tribal Hejazi women based their embroidery design elements from their environment, their embroidery was the researcher's inspiration for the textile design with the spirit of Hejaz nature. The colors from the natural environment in Hejaz determined colors in designs. The designer/researcher combined colors of the Red Sea such as

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coral, and ocean blue along with brown, maroon, and sand of the desert with some green that comes from the palm trees by the beach and in the desert (See Figure 3.1).

Figure 3.1: Natural Environment as a Source of Inspiration for the Colors Used in this Research

Generally, Arabic women used embroidery in floral and geometric designs for embellishing their clothing (Ross, 1981). Also, webs, loops, triangles, polygons, and squares were used (Almofti, 1997). Most Arabic artists created patterns based on religious motifs, climate and plants. In addition, Arabian tribes used motifs to distinguish identity between tribal groups (Gillow, 2010; Ross, 1981).

In terms of the patterns of the designs, the researcher liked the harmony of arranged shapes with the organic quality of handwork utilized in Hejazi embroidery; she thought that it reflected simplicity along with the beauty of delicate precision in spite the absence of technology. Geometric shapes were dominant in the tribal Hejaz embroidery (Al Mufti, 1997), which matched the arranged order of embroidery. In most designs for this research, the adapted

the geometric shapes were drawn in the Kaledo print design system with soft lines using the brush tool to keep the effect of the simple tribal work.

To embody the spirit of the tribal Hejazi embroidery in the textile designs, the researcher transposed the actual shape of embroidery stitches such as fly stitch, and appliqué embellishment into motifs in the digital textile designs. In the case of the spider web stitch (gob'a), which in actual stitched embroidery is compact and cone-shaped, the designer opened up the design to a spiral shape with simulated stitch lines superimposed on the spiral (see Figure 3.2). In other designs, the designer/researcher followed the order or the arrangement of the traditional patterns or motifs. Most importantly, in all the designs the researcher sought to consider the elements from the natural environment that surrounds and inspires the embroiderers in Hejaz.
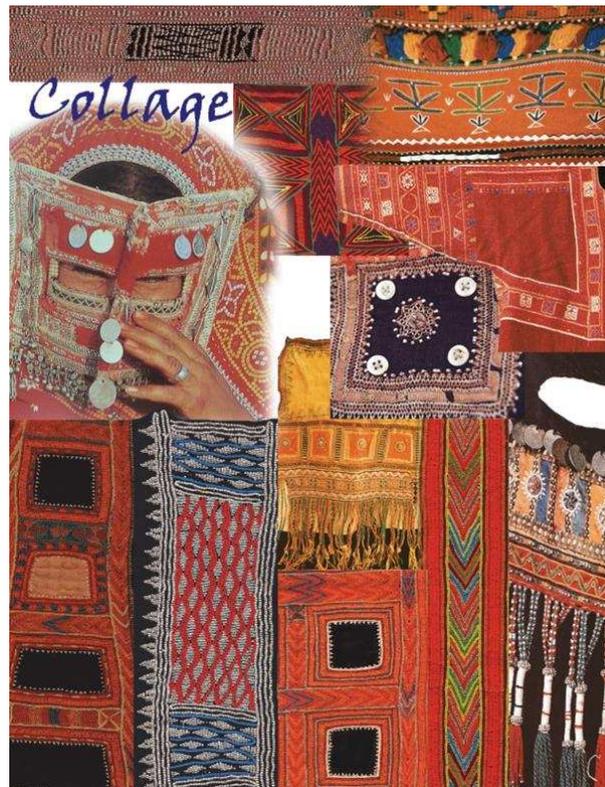
Figure 3.2: Collage of Traditional Hejazi Embroideries with Lead Beads, Tassels and Appliqué Used by the Researcher for Design Inspiration

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The researcher designed eight sets of garments using Lectra Kaledo software for textile design and Adobe Illustrator for apparel design. These designs were developed based on FEA Saudi female academics that the researcher found within the Arabic literature. The researcher chose colors that looked professional for the professional work environment. She also utilized style lines from the traditional dress applied to comfortable garment shapes and considered simplicity to fit with the activities that are performed in the academic workplace environment. The colors of the traditional embroidery were adjusted and softened in order to fit the look for work attire.

Preliminary Co-Design Phase

In the first phase of the co-design process, female academics were asked to respond to the drawings of the garment ensembles, suggest modifications, and make comments on the design possibilities sketched by the researcher. After permission from the Department of Clothing and Textiles at King Abdul Aziz University to contact faculty members, an online survey was sent to18 faculty members (with different ranks in academia) using the department's website list of the faculty. Reminder emails were sent to each person a week later. One faculty member was contacted by phone to remind her to answer the survey. Participants were selected via convenient sampling method.

The questionnaire was developed in English language and then translated to Arabic, the native language of the participants, and was sent via Survey Monkey. An Arabic pilot online survey was sent to a faculty member to check the clarity of language in the questions and the size of the images in the questionnaire. The researcher refined the questions after the feedback by

eliminating redundant questions in order to have a minimum number questions in the online questionnaire. Also the sequence of the questions was reordered for improved logic.

The questionnaire started with stating the purpose of the study. The questionnaire was comprised of three parts. The first part included demographic questions: age, years of teaching in apparel design field, the classes the participants had taught, and the approximate amount they pay for workplace attire annually. The second part of the questionnaire, using a five-point Likert scale (1 for disagree to 5 strongly agree), polled participants' attitudes related to their evaluation of the proposed eight sketches. The questionnaires included 12 items regarding FEA preferences. For example, do you think that this outfit would be comfortable for multiple sizes. Some items measured aesthetic aspects of sketches, using a five-point Likert scale (1 for not satisfying to 5 excellent) such as: what is your opinion about the colors of the outfit. Space was offered after each question for participants to add comments and opinions as co-designers.

In the third part of the online questionnaire each sketch had seven questions regarding FEA preferences (Lamb & Kallal, 1992) including color, style line, silhouette, textile design, professional looking, perceived comfort in walking, sitting, and work performance, and perceived comfort in the design if being in multiple sizes. Also this part of the questionnaire included five questions regarding the collection as a whole; one question was about the extent to which the participants thought the garments would be easy to care for if they were made of cotton. The other four questions were about expressive aspects of design; one of the questions asked about participants' attitudes as to whether they thought the tribal motifs looked stylish for work; whether the designs had a role in acceptance and non-verbal communication; whether wearing designs with tribal motifs at work would be acceptable, and if it would be meaningful to

wear any of the proposed garments at work. The time it took to answer the survey was approximately 20 minutes.

The names of faculty co-design participants were obtained from the Department Head of Clothing and Textiles at King Abdul Aziz University in Jeddah, Saudi Arabia. Results from this survey did yield an indication of the participant preferences, and their comments were influential in modifications leading to the final designs. Of the 18 persons recruited, only eight participants responded with the response rate very low at 44%.

Online data from the preliminary survey were analyzed using Survey Monkey analysis, and then the data was transferred to SPSS for statistical analysis. Descriptive analysis was conducted to compare data and preferences among the eight designs after reverse translation. This analysis enabled the researcher to see the general FEA preferences regarding the eight designs as workplace outfits, and the information was useful in revising the final designs.

Design Development and Refinement Phase

After analyzing participants' survey responses, the designs were modified considering the FEA dimensions of the Saudi female academic professional preferences. Based on favorable quantitative data, the researcher proceeded with design refinement even with limited qualitative feedback. To proceed, the researcher made changes in the designs regarding participants' FEA aspects of design based on the ratings in the data to create designs that would better match the participants' preferences.

Prototype Construction Phase

After design refinement, Kaledo Print software was used to re-design the textile prints which were digitally printed on 100% cotton. Garment patterns were drafted and draped on an industrial dress form. The garment patterns were digitized using Lectra Modaris software. Cutting and constructing the garment pieces was done after minimal hand embroidery was applied to the surface of the printed fabric in select locations of the eight garments.

Each garment was produced in an attempt to meet participants' FEA preferences with a minimum amount of handwork used. All the designs utilized the Hejazi structure of style lines with few variations between designs. The completed garments were photographed in Saudi Arabia, to show study participants during the final evaluation phase of the co-design process.

Evaluation Phase

Based on the low response rate from the preliminary online survey, it was decided that the second survey and focus group discussion would be conducted face-to-face in Saudi Arabia, as a strategy to get a higher response rate and involvement of participants. The participants who were involved as co-designers were previously identified as potential end–users for the finished garments.

The evaluation phase included a survey along with a focus group discussion. The questionnaire was comprised of two parts, the first part had questions regarding demographic information: age, years of teaching in apparel design field, classes that the participants had taught in apparel design, and the approximate dollar amount the participants spent annually for workplace attire. The second part of the questionnaire included a combination of a five-point Likert scale and open-ended questions along with spaces for qualitative comments. The

questions included FEA aspects to evaluate the eight finished garments. The functional aspect included questions regarding ease of care, ability of garments to fit multiple-size individuals, and comfort in work performance. The expressive section included questions regarding professional appearance of the garments, and meaning and/or potential communication that could happen by wearing any of the garments. The aesthetic section included questions about color, style line, silhouette, and textile design. The questionnaire was developed in English language, and then translated into Arabic, as it was the native language of the study participants.

In addition to quantitative research questions, a focus group approach was used to evaluate the collection of eight garment ensembles. The items included introductory, main, and concluding open-ended questions. Follow-up and prompting questions were used to clarify, give examples or encourage detailed answers. This helped the researcher observe the level of agreement within the group, and to ascertain what FEA changes they would like to see in the garments in order to meet their preferences. The focus group discussion lasted approximately 65 minutes.

The conversation was in Arabic language. The questions included describing participants' favorite dress for work, what they thought generally about the proposed garments, if they would wear any of them and why, and what FEA changes could be made so they would wear them. The questions also polled the participants' attitudes as to whether it was meaningful to wear local area prints on the fabric; what amount of space in the designs should have tribal motifs on the garments so they would look fashionable; what they thought about combining hand embroidery with the technology of digital printed textiles; and how they might feel if they wore clothing that had elements of traditional dress in special occasions compared to how they would feel and perceive themselves wearing any of the presented garments in the work environment.

The final evaluation process started with contacting the department head of Clothing and Textiles in King Abdul Aziz University to schedule time for a meeting to provide her with the data collection schedule. Meeting off campus was the recommended approach to conducting a focus group, as it would be more informal and comfortable for the participants to provide more valuable feedback in the discussion (Krueger & Casey, 2000). The study participants however, preferred to meet on campus, as it would better fit with their schedules, and the researcher thought that this would assure a larger number of participants and maximize time outside of the U.S.

The data collection process was held with 12 participants in one of the clothing and textiles laboratory rooms. The researcher began the session with a presentation of photographs of the designs on a live model using power point. In addition, the actual finished garments were displayed for participants to touch and observe the details of the garments. The presentation was intended to elicit feedback as answers to survey questions as co-designers for each of the eight designs. Also the researcher wanted to ascertain the degree to which the designs met the FEA needs of the participants. A pre-test for the questionnaire and the focus group discussion was conducted with a group of five faculty members before the date of collecting actual data, to ensure that the order of the questions was appropriate and easy to follow. It took approximately 30 minutes to answer the survey.

After the participants completed the survey, the researcher began the focus group, by encouraging the participants to communicate their personal opinions with each other regarding the questions. The focus group session was tape recorded.

The researcher used SPSS to analyze the quantitative data from the questionnaires. Descriptive analysis was used to compare preferences among the eight finished garments. The researcher then started the qualitative data analysis process with transcribing the data with the aid of online transcription. Next, the transcription was sent to an official translation office to ensure translation accuracy.

Constant comparative analysis method (Strauss & Corbin, 1990) was used to analyze the qualitative data. The researcher started with applying concepts from the FEA consumer needs model in the process of open coding. After grouping the open codes in categories, the researcher started the focused coding where she grouped data into focused categories. For validation purposes, a second coder worked with the researcher to review the open codes.

Validity, Reliability, and Issues of Subjectivity

Having quantitative and qualitative approaches in data collection and analysis provided validation for the design process and the findings of the study. Conducting the focus group in the second phase of the design process helped to support the reliability (Glesne, 2011) of the study in terms of allowing participants to provide preferences verbally in an informal environment. Prolonged engagement of the researcher in the field was achieved as she used to be a student and a faculty member at this University, and it helped her to understand the culture and to understand the background of the study participants. It also helped in developing rapport between the researcher and the participants. Subsequently, the participants were comfortable enough to provide information about their personal preferences and experience with the researcher who was from the same culture and speaks Arabic, the native language of the participants. However, the

researcher considered the possible bias toward the participants' responses due to her prior interaction with them.

In terms of researcher subjectivity, the researcher had the desire to bring out variations of traditional dress that were limited to being worn in special occasions, by producing stylish modern attire with traditional inspiration for workplace use. Being influenced by her study in apparel design and having background in Arabic traditional dress, the researcher had the curiosity to explore how other faculty members in the department might respond to that idea.

The researcher's bias from personal observation was in knowing that the idea of looking old-fashioned was the reason that might prevent some of the participants to not accept the fundamental premise of the design work and thus the study. With that bias, the researcher tried to keep in mind the importance of considering open-mindedness while analyzing the data. Allowing for the likelihood that participants would have different opinions and maintaining transparency as a researcher were used to support the trustworthiness of the findings of the study.

Prolonged engagement was also achieved by comparing the first data analysis with the evaluation data analysis. Conducting the focus group helped the researcher to confirm the quantitative results of the study. Photo-documentation of the sketches, as well as the finished garments, along with documentation of the design process provided reliability that the study to be replicable.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this research was to create a collection of professional attire for Saudi female academics based on their preferences. The textile and apparel designs were inspired by ethnic embroidery of the western province (Hejaz) of Saudi Arabia. Two models were used in the research. Lamb and Kallal's Functional, Expressive, and Aesthetic (FEA) model was used to contextualize and define the Saudi female academic preferences for work attire (1992). And a modified version of the participatory design model (Demirbilek & Demirkan, 2004) was used to inform the collaborative design process in which a small group of Saudi female academics were engaged in the design process as participants. The ultimate goal of the research was to establish an approach to collaboratively designing a product line of professional attire for Saudi female academics in Hejaz. The design line combined traditional Hejazi tribal embroidery techniques with state-of-the-art digital textile printing, digital illustration, and digital pattern drafting technology.

Research Objectives were to:

- Produce a collection of professional attire that had Hejazi-inspired, CAD printed fabric which was embellished with minimal hand embroidery for Saudi female academics, and to evaluate the collection based on participant FEA preferences, using the FEA consumer needs model.

- Measure the extent to which Saudi female academics are willing to wear cultural ethnic dress visually related to the tribal area in which they live, in this time period that is influenced by standardized western clothing in the global marketplace.

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- Measure the extent to which Saudi female academics would be willing to pay for a culturally inspired form of professional dress.

- Measure the extent to which Saudi female academics would value hand embroidery in this era of technology.

Research Questions

- Was it possible to combine traditional Hejazi embroidery patterns with digital printing technology?

- Would Saudi female academic professionals in Jeddah be interested in wearing professional attire that has ethnic-inspired, CAD printed fabric embellished with hand embroidery in comparison to their usual Western-style work attire?

This chapter is comprised of three parts. The first part includes the demographic information of the study participants. The second part includes the findings from analyzing the initial online survey, design refinement, and final revised designs used in the evaluation phase of the participatory design process and discussion of the findings. The third part of the results section includes the findings from the focus group discussion during the final evaluation phase of the design research and discussion of the findings.

Demographic Information

The demographic information showed that the sample was comprised of female academics whose ages ranged between 33 and 52, with a mean age of 42.63. The subject courses that had been taught by the participants included draping, fashion illustration, historic dress, tricot within knit textile design, crochet, hand embroidery, traditional dress (history of costume), flat pattern drafting, and fashion merchandising. The mean of years in the teaching profession in

the apparel design field was 17.36 years, with one participant below the mean who had taught for 4 years.

General Findings

General findings found in the first survey guided the design refinement process. The last part of the preliminary online survey was comprised of general questions for all the designs. In analyzing the data from the preliminary survey, a composite score was developed by averaging scores for the eight garments to create factors for the FEA aspects of design. Descriptive statistics showed that participants thought that the tribal motifs looked somewhat stylish on professional dress (M=4.00). Similarly, results show that tribal motifs in professional dress were somewhat meaningful (M=4.00). Descriptive statistics also showed that participants thought that wearing professional dress that had tribal motifs was somewhat positive for non-verbal communication and acceptance (M=4.00). And results showed that participants thought that wearing tribal motifs on the designs included in this study would be acceptable for work attire (M=4.00).

One question regarding the functional aspect was intended to assess participants' opinions about the ease of care for the garments, proposing that linen and cotton would be the preferred fabrics to use in producing the designs. In addition, descriptive statistics showed that participants thought that cotton and linen would be the preferred fabric with which to produce the garments (M=3.75).

The following section contains an analysis of the eight designs from the first phase through the final phase of the participatory design process. The order of the designs in this section was based on participant final evaluation ratings from the highest to the lowest of the

finished garments based on the aesthetic aspect, followed by the functional and lastly the expressive aspect of design.

The results and discussion chapter demonstrates the accomplishment of research objective 1, which was: to produce a collection of professional attire that had Hejazi-inspired, CAD printed fabric which was lightly embellished with hand embroidery for Saudi female academics, and to evaluate the collection based on their FEA preferences.

The following system is used when presenting results obtained through the different phases of the project in each of the eight designs:

1. The inspiration from a) traditional embroidery and b) traditional dresses

2. The initial a) textile designs and b) garment designs that were used in the online survey

3. The results from the online survey that were used to revise the textile and garment designs

4. Design refinements

5. The description of final designs

6. The images of a) final textile designs and b) final garments

7. The results from the final onsite evaluation survey and focus group

8. The discussion of the findings

Silver Waves Design

Inspiration from Traditional Embroidery

Figure 4. 1 Black Squares with Chain Stitch Embroidery

Figure 4. 2 Black Beaded Area on Rose Fabric

Figure 4. 3 Al-Gob'a Stitches on Striped Colored Fabric

Inspiration from Traditional Dress

Figure 4.4: Bani Sulaim Tribe Thawb

Figure 4.5: Bani Sa'ad Taif Region Thawb

Initial Textile Design

Figure 4.6: Initial Silver Waves Textile Design – Preliminary Online Survey

Initial Sketch of Garment Design

Figure 4.7:   Initial Illustration of Silver Waves Design – Preliminary Online Survey

Findings from the Online Survey

A composite score was developed by averaging the eight garments to create factors for the FEA aspects of design. Descriptive statistics showed that Silver Waves received a rating with the mean of 4.13 on the functional factor. Silver Waves also received a rating with the mean of 3.63 on the expressive factor. It received a rating with the mean of 3.69 on the aesthetic factor from the participants. Qualitative data showed that participant # 4 preferred a longer top for this design in terms of the silhouette and the professional look "if the top was longer it would be excellent" Participant 11.

Design Refinement in Response to Preliminary Assessment

The pleats in the top of this design were exchanged with fine lines made with covered cording using light colored solid fabric. A traditional style collar was added. Also, a version of this design with a skirt was added. The pant leg width was narrowed. There was a change in the designed textiles and the amounts distributed in the sections of the garment. The solid purple fabric was replaced with grey fabric.
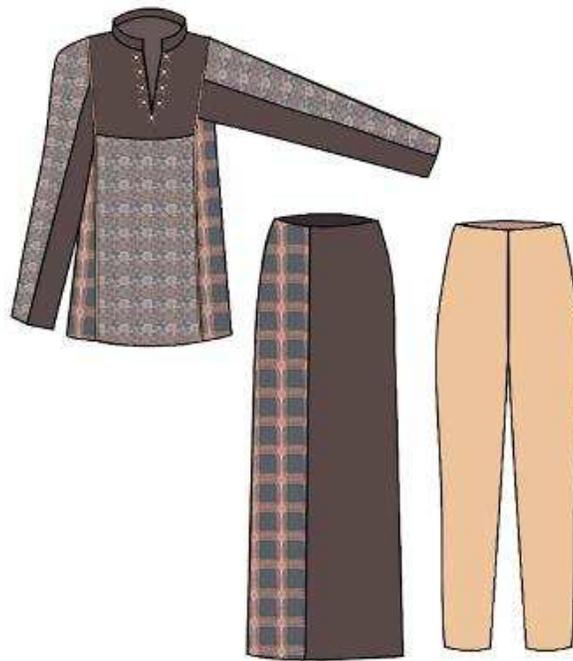
Figure 4.8:   Revised Illustration of Silver Waves Design – Final Evaluation Survey
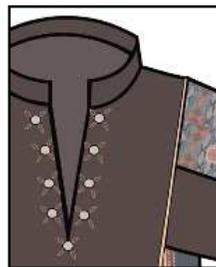
Figure 4.9:   Detail of Revised Silver Waves Neckline Treatment – Final Evaluation

Description of Final Design

The Silver Waves design had two versions, and was mainly inspired from the Harb and Balhareth tribes' traditional Thawb. One version was comprised of a top and a skirt, and the other version was comprised of the same top shown with a pair of pants.

The grey fabric was a variation of the black color found in most traditional Thawbs. Other colors used in the textile for this design were inspired from the colorful embroidery in the traditional Thawb. The plaid orientation in the silver waves textile design was inspired from embroidery patterns in Bani Sulaim tribe's traditional Thawbs. The spider web stitch Gob'a that looked like flowers was inspired from Al Gob'a stitch in the traditional Bani Sulaim Thawb. Also the plaid in the fabric reflected embroidery patterns on the sides of the traditional Thawb as well as the use of appliqué. The small triangles in the fabric design imitated the embroidery patterns in the traditional dress, which were traditionally embroidered with Chain stitch.

In the traditional Thawb, the zigzag shape in the plaid fabric was usually worked with Fly stitch, and the borders in the fabric were usually worked with a type of Chain stitch. The wave pattern in the traditional Thawb was usually worked with lead beads. The Silver Waves design was the only one in the study that had two different textiles that were not coordinated. The collar was inspired from Harb tribe's Thawb. The "V" neckline, embellished with mother of pearl buttons, was also inspired from the traditional Thawb. Touches of a type of Chain stitch with thread and lead beads embellished the perimeter of the buttons.

Final Textile Designs
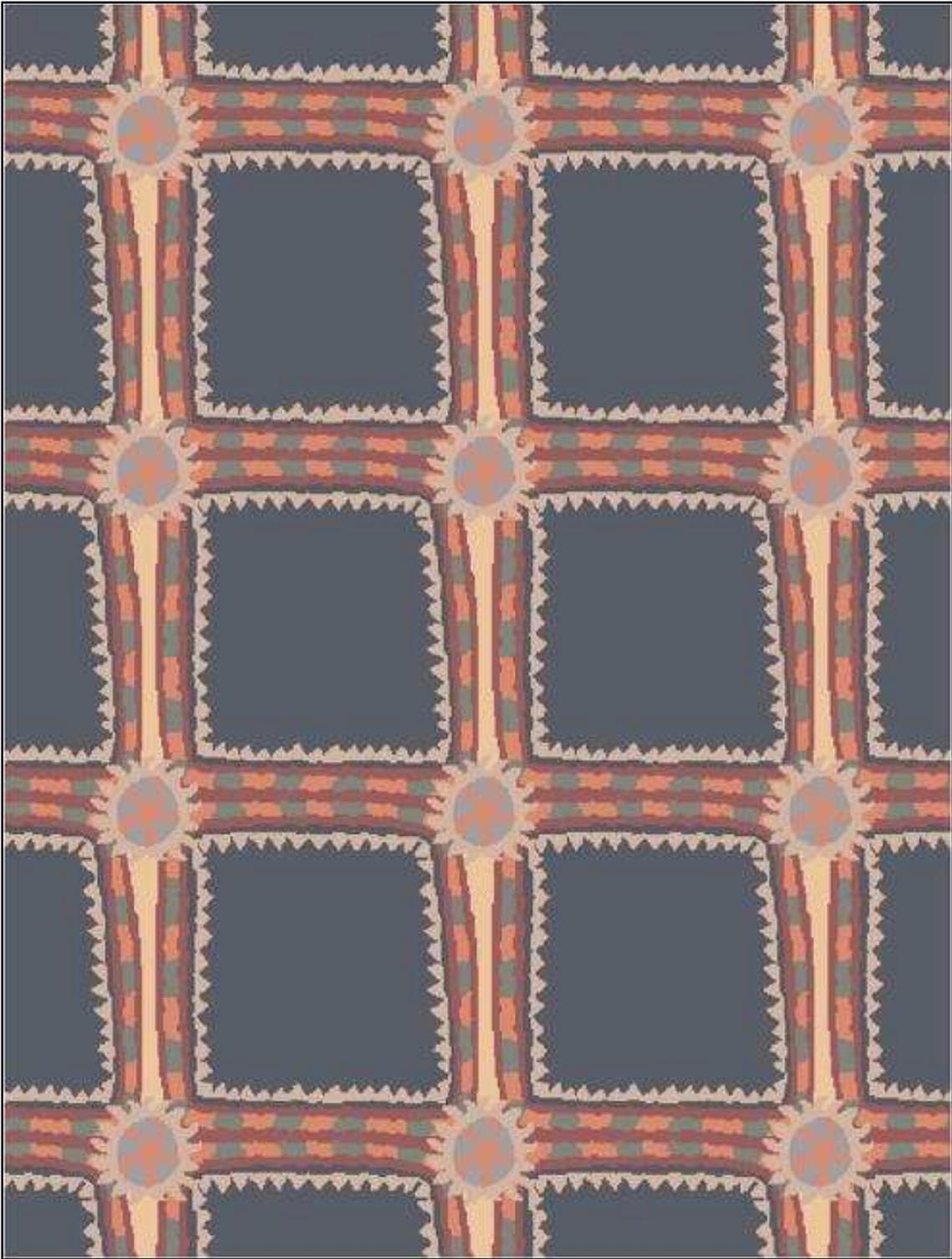
Figure 4.10:   Revised Silver Waves Textile Design 1– Final Evaluation

Figure 4.11:   Revised Silver Waves Textile Design 2– Final Evaluation

Final Garment Design

Figure 4.12:   Revised Silver Waves Design with Skirt– Final Evaluation

Figure 4.13: Side View of Silver Waves Design with Skirt and Embroidery Detail– Final

Evaluation

Figure 4.14:   Revised Silver Waves Design with Pants – Final Evaluation

Findings from the Final Evaluation Survey

Descriptive statistics showed that Silver Waves Design received a rating with a mean of 4.69 on the functional factor, a rating with a mean of 4.69 on the expressive factor, and a rating with a mean of M=4.86 on the aesthetic factor from the participants on the version with the pants.

Qualitative data further showed that Participants #1, 3, 5, 7, 8, and 10 preferred the pants version of this design. Participant # 2 explained her preference for the pants in this design by saying "its color matches perfectly the top because it reflects the colors and motifs of the top". Participant # 11 thought that the design with the pants would be more comfortable. On the other hand, Participant # 5 stated a preference for plain skirt without any print fabric.

Discussion

Changes in Silver Waves design were implemented in the aesthetic aspect of the garment, which included the style lines, designed textiles and their distribution in the garment, and the color of the solid fabric. These changes were not only considered as aesthetic but also expressive because the two aspects were interrelated. One functional change was implemented in terms of the garment components. The highest rating for this design was in the aesthetic aspect, whereas the expressive and functional aspects received the same rating. Participants appreciated the design with the pants more than the skirt in terms of the functional aspect. This is consistent with previous research as the set of a two-piece outfit for work attire was recommended (Bark, 1987; Turkustani, 1995). The participants showed their appreciation for color contrast within the top and combination of the top with the pants. They also appreciated the traditional style in a contemporary look of the garment. Both findings showed participants' interest in wearing work attire that was expressive of ethnic identity.

Hejaz Gob'a Design

Inspiration from Traditional Embroidery

Figure 4.15: Red and Blue Bead Embroidery on Black Fabric

Figure 4.16: Black Square Embroidery

Inspiration from Traditional Dress

Figure 4.17: Bani Sulaim Tribe Thawb

Initial Textile Design
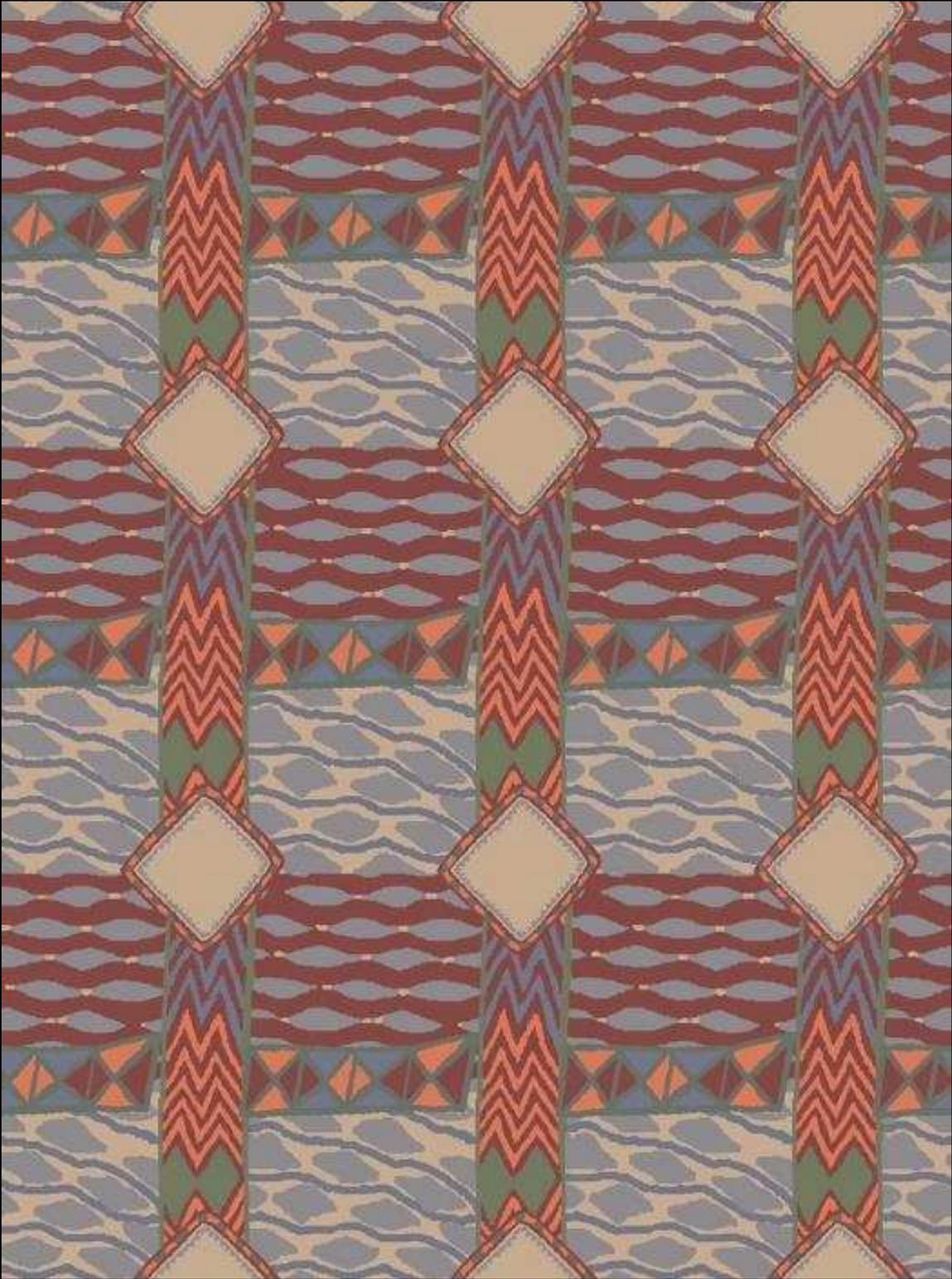
Figure 4.18:   Initial Hejaz Gob'a Textile Design – Preliminary Online Survey

Initial Sketch of Garment Design
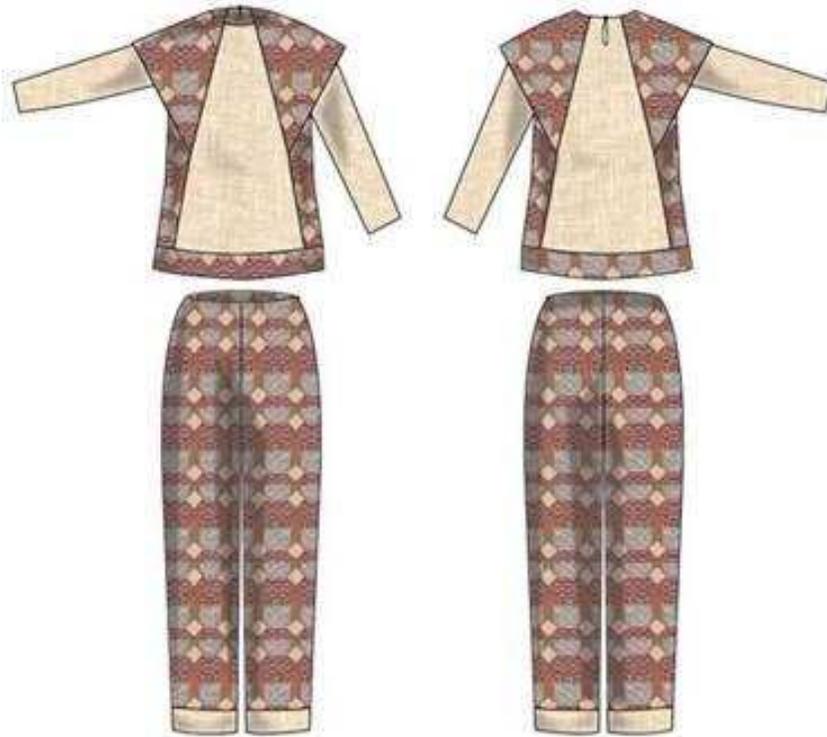
Figure 4.19:   Initial Illustration of Hejaz Gob'a Design – Preliminary Online Survey

Findings from the Online Survey

Descriptive statistics showed that Hejaz Gob'a Design received a rating with a mean of 4.13 on the functional factor, a rating with the mean of 3.63 on the expressive factor, and a rating with the mean of 3.28 on the aesthetic factor from the participants.

Design Refinement in Response to Preliminary Assessment

The design in the first illustration was completely transformed, and a version with pants was created. Emphasis on the sleeves remained in the revised illustration with the use of stripes. Design emphasis was also focused on the chest area, cuffs, hem of the top, and the skirt.

Figure 4.20: Revised Illustration of Hejaz Gob'a Design – Final Evaluation

Description of Final Design

This design had two versions that were mainly inspired from Bani Sulaim and Bani Thaqeef tribes' Thawb. The two versions had the same top, but they had different bottoms. One version had a pair of pants and the other one included a skirt. Colors and shapes in the designed textile for this design were inspired from the sand colors and reddish brown colors of the mountains of Hejaz, along with the waves of the red sea. Stripes on the sleeves were inspired from Harb tribe's Thawbs. The outline decoration on the neckline reflected the geometrical lines on the neckline of the traditional dress, especially in Taif's Thawb. A small slit on the back with a looped buttonhole and a mother of pearl button were used for a closure for the top. Touches of spider web stitch (Gob'a) on the designed textile in the neckline area was worked with metallic-

appearing Lurex and cotton thread. The horizontal stripes on the cuffs and the hem in the skirt were inspired from the location of embroidery in the traditional Thawb. Spiral shapes in the designed textile reflected the spiral shape of the Gob'a stitch, and the triangles represented the patterns of embroidery in the traditional Thawb.

Final Textile Designs
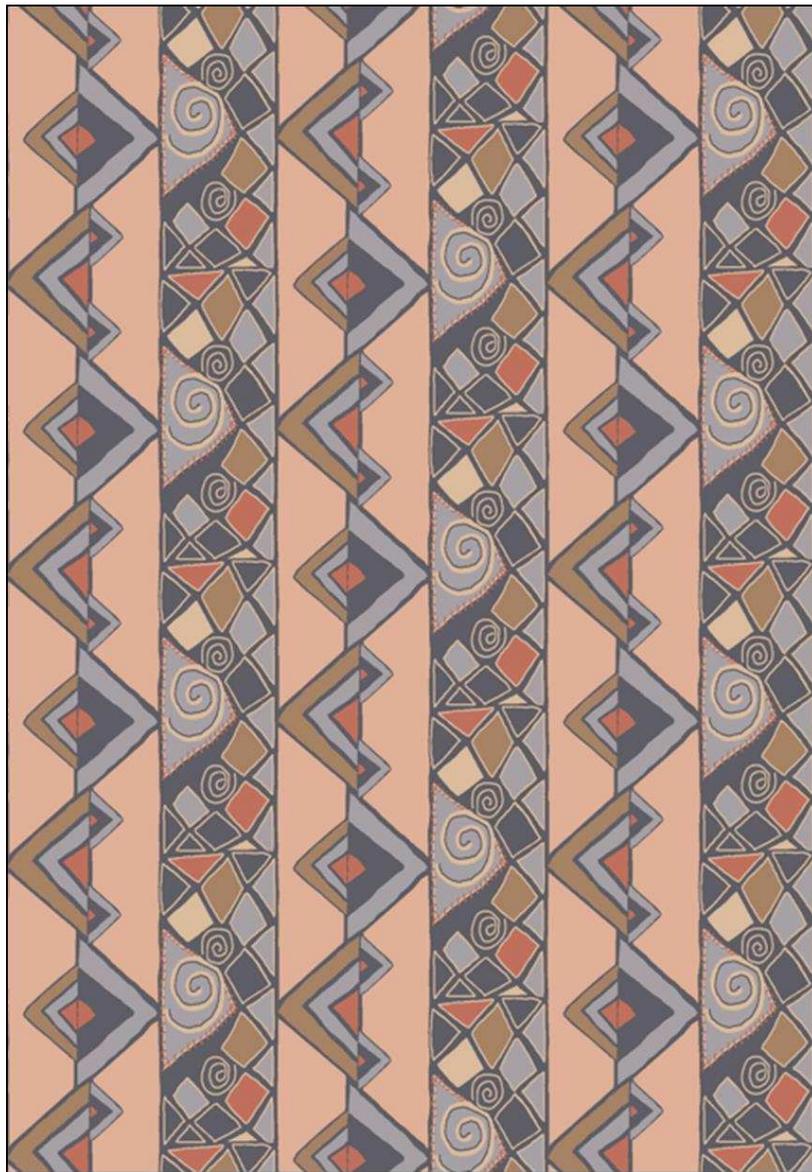
Figure 4.21:   Revised Hejaz Gob'a Textile Design 1– Final Evaluation
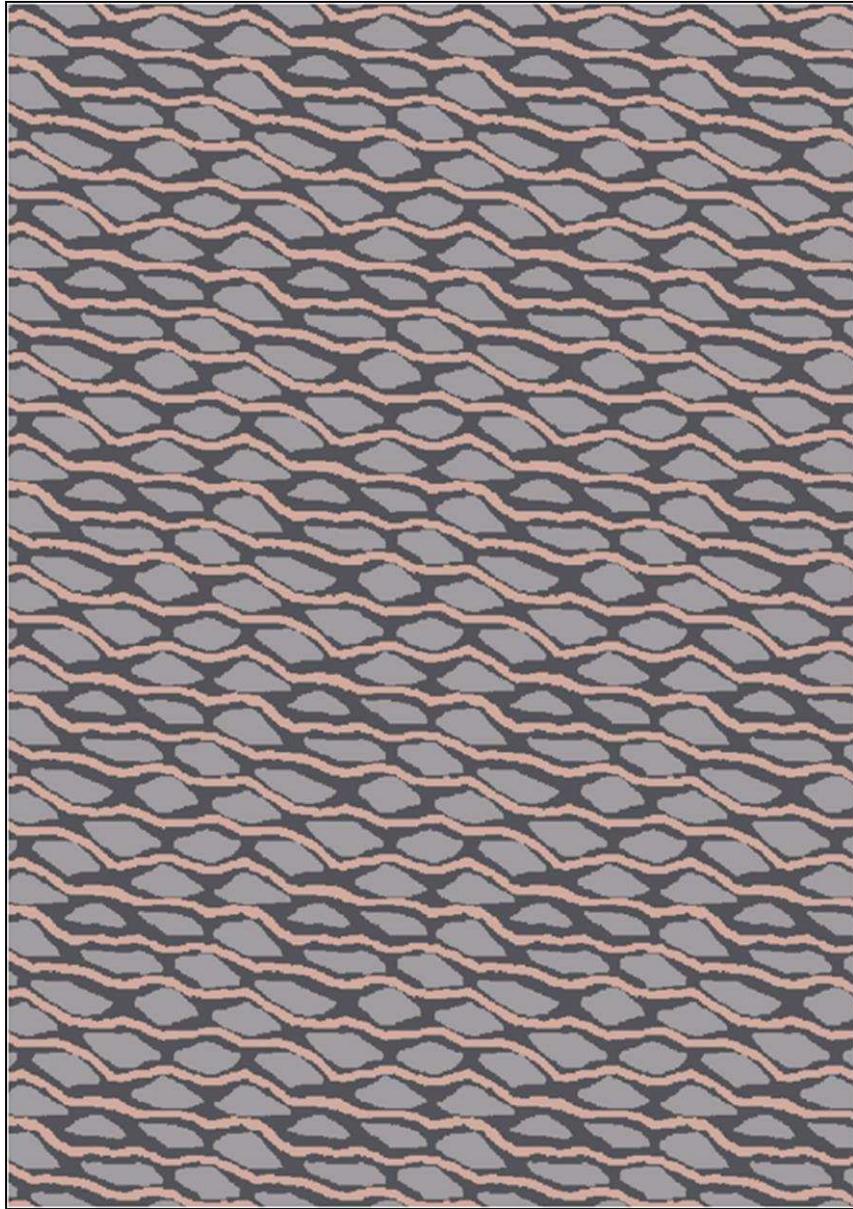
Figure 4.22:   Revised Textile Design 2 for Hejaz Gob'a – Final Evaluation

Final Garment Design

Figure 4.23:   Final Hejaz Gob'a Design with Skirt– Final Evaluation

Figure 4.24:   Final Hejaz Gob'a Design with Pants– Final Evaluation

Figure 4.25: Hejaz Gob'a Design Embroidery Detail– Final Evaluation

Findings from the Final Evaluation Survey

Descriptive statistics showed that Hejaz Gob'a Design received a rating with a mean of 4.44 on the functional factor, a rating with mean of 4.56 on the expressive factor, and a rating with a mean of 4.72 on the aesthetic factor from the participants. Qualitative data showed that P2 thought "The embroidery stitch is very beautiful and it is a high addition to the top especially with metal thread". Participant 4 added "however, metal thread embroidery could get damaged by regular washing".

Discussion

The changes in the Hejaz Gob'a design reflect the aesthetic and the expressive aspects of the garment style lines and the silhouette of the garment. A change was implemented in the functional aspect in terms of offering more component garments which would allow the wearer to mix and match the top with multiple bottoms. The aesthetic aspect of the garment received the highest rating, and the lowest rating was in the functional aspect. Most participants appreciated the expressive aspect of this garment as its general look is very similar to the traditional Thawb, which implied their positive regard for presenting their ethnic identity. Embellishment of the neckline which emphasized the traditional look was appreciated by the participants; however, this might be the reason this design received its least rating in the functional aspect. Metal thread was used in embroidery, and may have been perceived to make the garment require dry-cleaning instead of being washable. According to Al-Amoudi and Turkustani (1994), there is a need to consider the functional aspects of design when producing women's work attire that require the least need of care.

Green Palms Design

Inspiration from Traditional Embroidery

Figure 4.26: Colorful Triangles Embroidery

Figure 4.27: Black Beaded Area on Rose Fabric

Figure 4.28: Colorful V-Shapes Embroidery

Inspiration from Traditional Dress

Figure 4.29:   Harb Tribe Thawb

Figure 4.30:   Thaqeef Tribe, Taif Region Thawb

Figure 4.31: Neckline and Sleeve of Bani Sulaim Tribe Thawb

Initial Textile Design
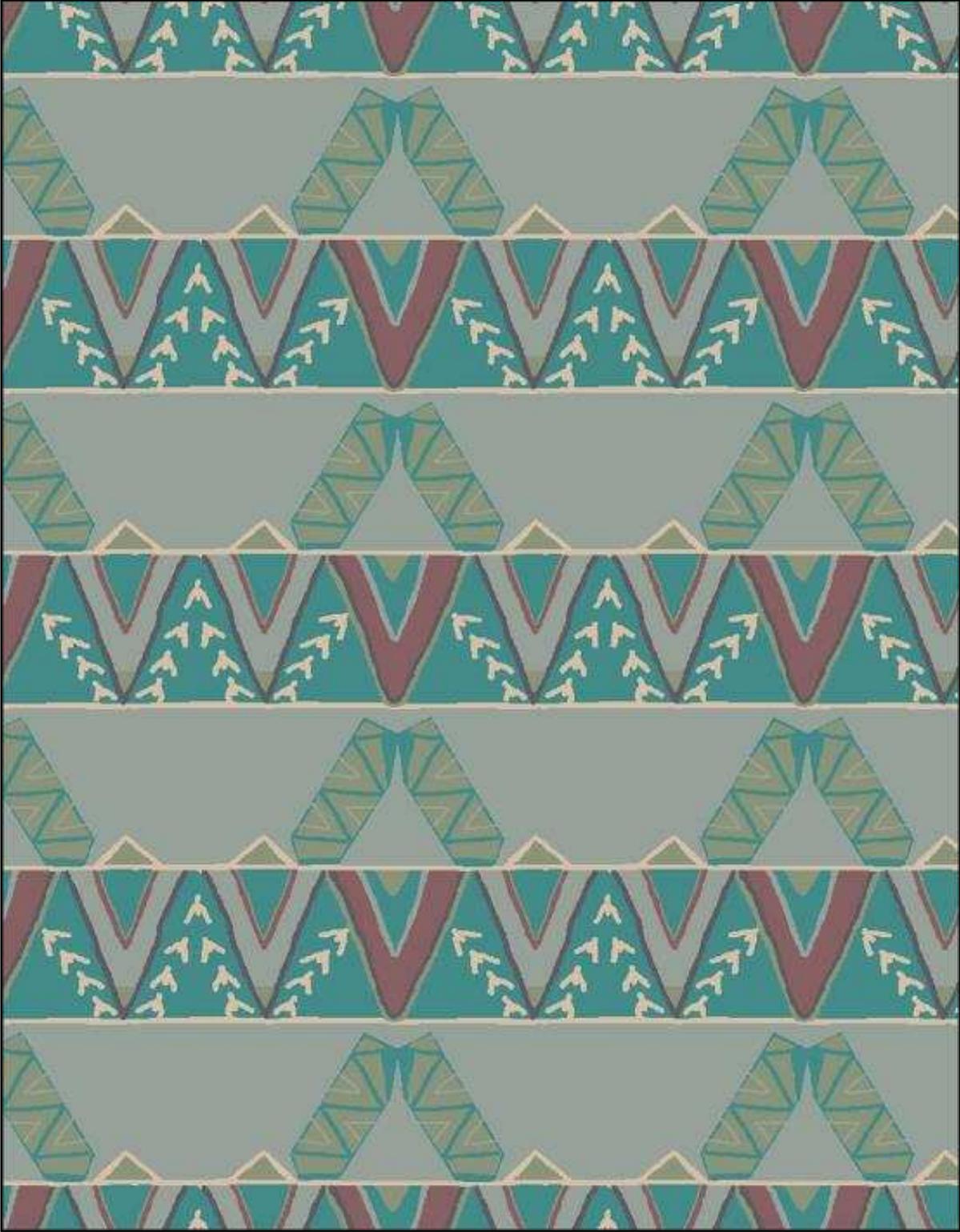
Figure 4.32:   Initial Textile Design for Green Palms – Preliminary Online Survey

Initial Sketch of Garment Design

Figure 4.33:   Initial Illustration of Green Palms Design – Preliminary Online Survey

Findings from the Online Survey

Descriptive statistics showed that Green Palms Design received a rating with a mean of 4.19 on the functional factor, received a rating with a mean of 4.25 on the expressive factor, and a rating with a mean of 4.25 on the aesthetic factor from the participants.

Design Refinement in Response to Preliminary Assessment

Design modifications implemented on the Green Palms design were on the shoulder and the neckline style, which included the opening in the shoulder and the overlapped stripes on the

neckline. Stripes were also added to the cuffs and the hem of the top. A version of the design with pants was produced.

Figure 4.34:   Revised Illustration of Green Palms Design – Final Evaluation

Figure 4.35:   Detail Revised Neckline Treatment of Green Palms Design – Final Evaluation

Description of Final Design

The Revised Green Palms design was developed in two versions that were mainly inspired from Harb Thawb. The two versions had the same top with two different bottoms. One version had a skirt and the other version had a pair of pants. The green palms of Hejaz were the inspiration for the colors of this design. The style line was inspired from the typical Hejazi dress. Location of the designed textile on the hem, cuffs and neckline was inspired from the appliqué location in Harb tribe's Thawb. A touch of the Fly stitch was done in the front neckline matching the Fly stitch in the digitally designed and printed textile. Mother of pearl buttons centered the decoration at the neckline, which was inspired from Bani Salim tribe's Thawb. The Green Palms textile design reflected zigzag patterns that were in most Hejazi Thawbs, worked with Chain stitch or other stitches such as Fly stitch. Looped buttonholes and mother of pearl buttons were used as closure on the shoulders, and they were inspired from Bani Salim tribe's Thawb.

Final Textile Designs
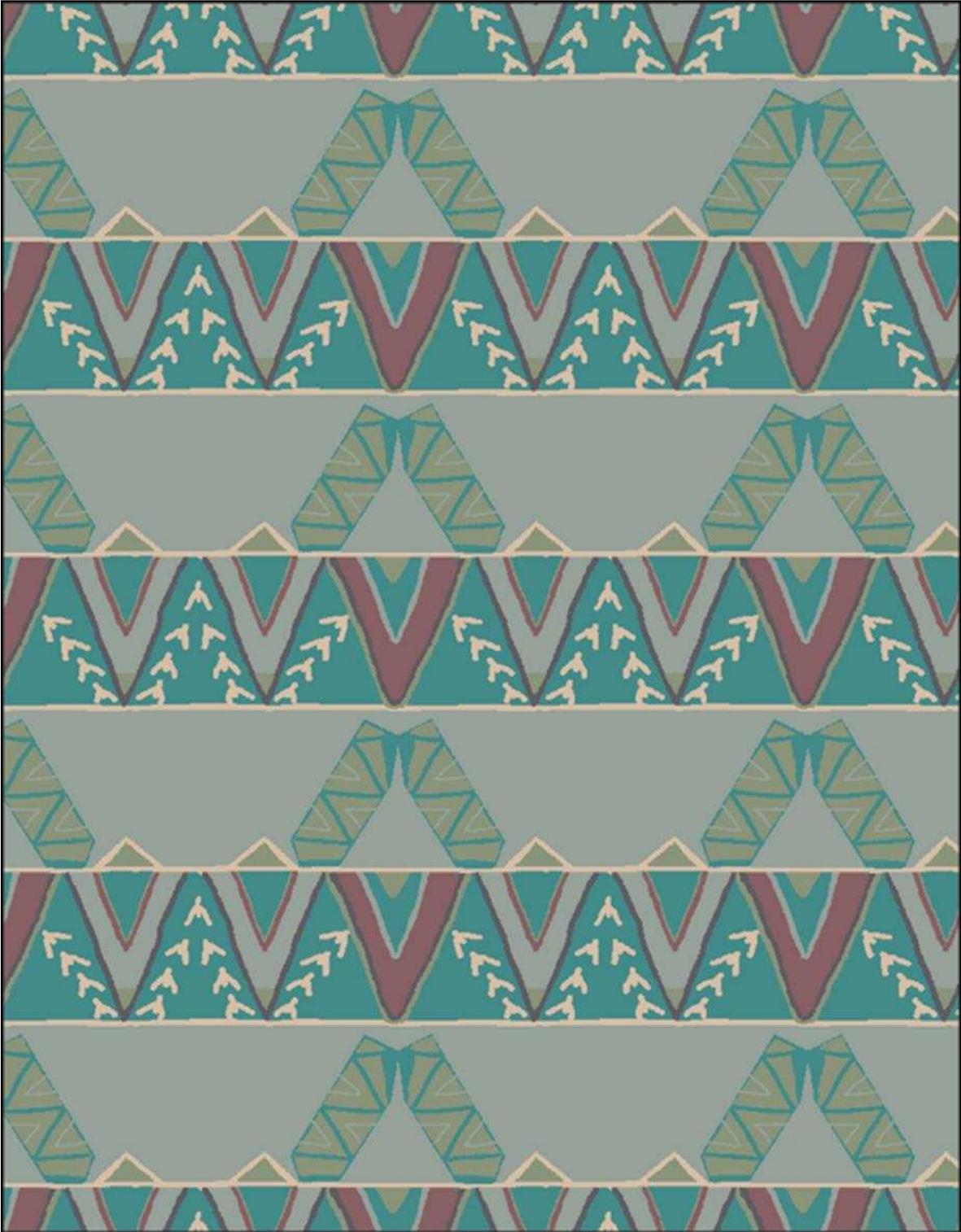
Figure 4.36:   Revised Green Palms Textile Design 1 – Final Evaluation
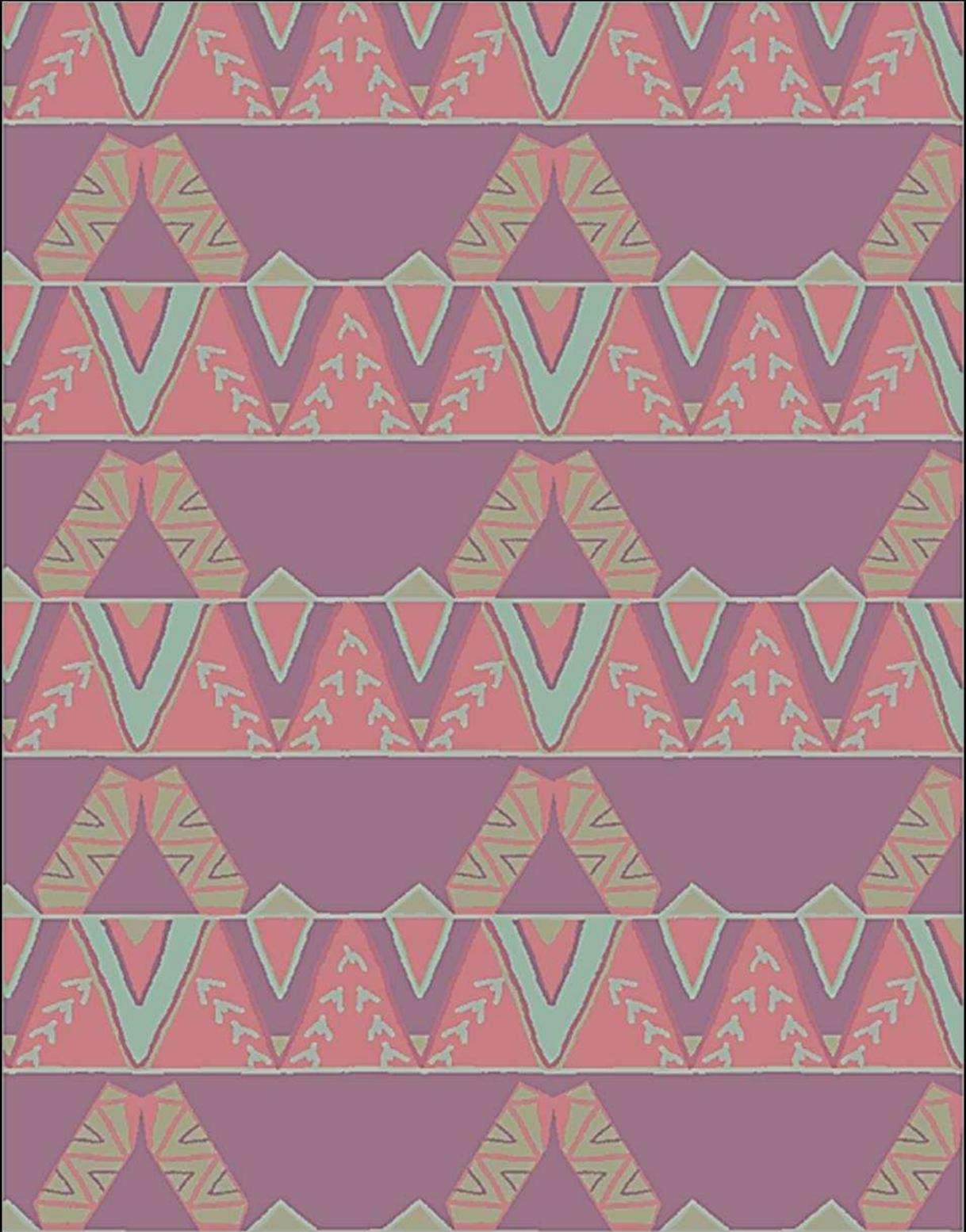
Figure 4.37:   Revised Green Palms Textile Design 2 – Final Evaluation

Final Garment Design

Figure 4.38: Final Green Palms Design with Skirt– Final Evaluation

Figure 4.39:   Final Green Palms Design with Pants- Final Evaluation
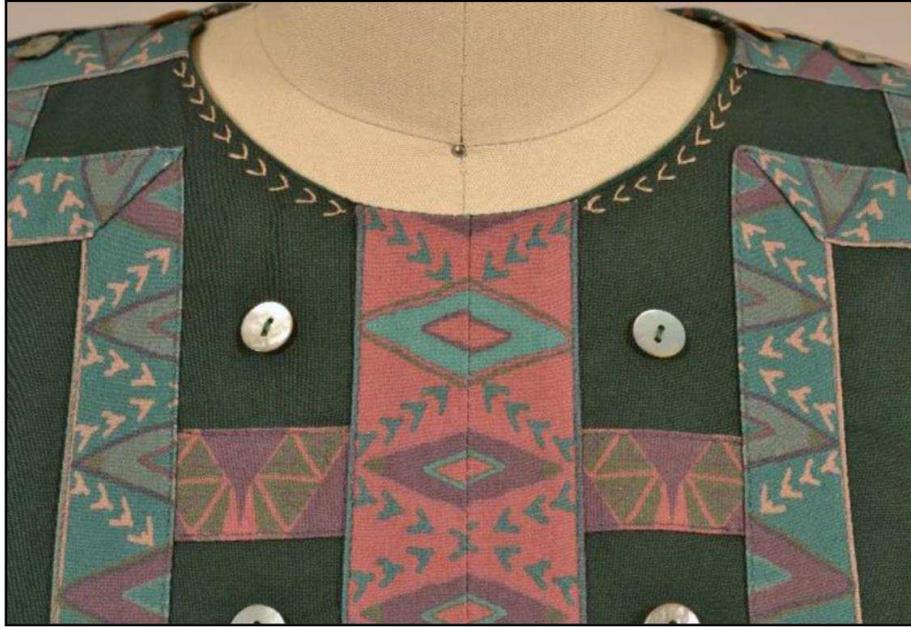
Figure 4.40: Embroidery Detail of Final Green Palms Design- Final Evaluation

Findings from the Final Evaluation Survey

Descriptive statistics showed that Green Palms Design received a rating with a mean of 4.47 on the functional factor, a rating with a mean of 4.22 on the expressive factor, and a rating with a mean of 4.64 on the aesthetic factor from the participants.

Qualitative data further showed that participant 2 preferred the top with light color, while participant 3 preferred dark orange for the bottom. For comments regarding which bottom designs were desired, participant 5 preferred the skirt with this design, while participant7 and participant 8 preferred the pants with this design.

Discussion

Design modifications implemented on the Green Palms design included style lines that represented both expressive and aesthetic aspects in the garment. The functional change was implemented in the garment components. The design received highest rating on its aesthetic aspect, while the expressive aspect received the lowest rating for this garment.

Although the design had traditional style lines and motifs in the printed fabric, the color contrast was not appreciated, and could be the reason why the design received lowest rating in its expressive aspect, as the traditional ethnic dress was known for color contrast. This was supported by Eckman, Takagi, and Tremblay (2012) where they found that consumers are influenced by nationality in terms of their aesthetic preferences of textiles. Skirt fabric color was not acceptable in this garment and a preference for light color in the top was also implied. This showed the interrelation of the expressive and aesthetic attributes, and how each attribute could affect the other in the design evaluation.

Inspiration from Traditional Embroidery

Figure 4.41:   Black Bead Embroidery with Colored Thread

Figure 4.42:   Black Square Embroidery with Colored Thread

Figure 4.43:   Al-Gob'a Stitches on Striped Colored Fabric

Inspiration from Traditional Dress
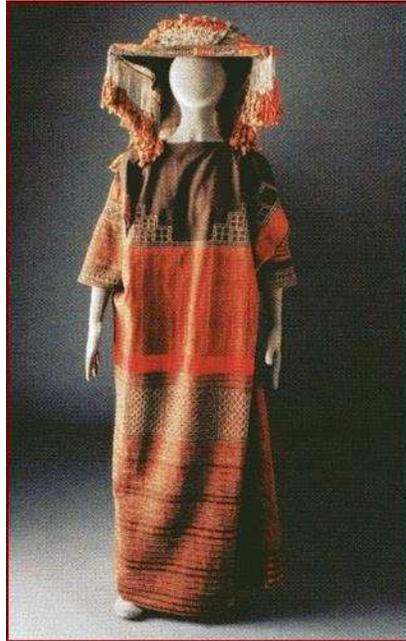
Figure 4.44:   Al Jahdali Thawb

Figure 4.45:   Bani Thaqeef, Taif Region Thawb

Initial Textile Design

Figure 4.46:   Initial Red Mountain Chain Textile Design – Preliminary Online Survey

Initial Sketch of Garment Design

Figure 4.47:   Initial Illustration of Red Mountain Chain Design – Preliminary Online Survey

Findings from the Online Survey

Descriptive statistics showed that Red Mountain Chain Design received a rating with a mean of 4.19 on the functional factor, a higher rating with a mean of 4.25 on the expressive factor, and a rating with a mean of 4.25 on the aesthetic factor from the participants.

Design Refinement in Response to Preliminary Assessment

The color of the solid coral fabric was changed to a deeper shade of red; a similar fabric that had plaid patterns replaced the one in the Illustration. In addition, the pleat in the skirt was lengthened.

Figure 4.48: Revised Illustration of Red Mountain Chain Design – Final Evaluation
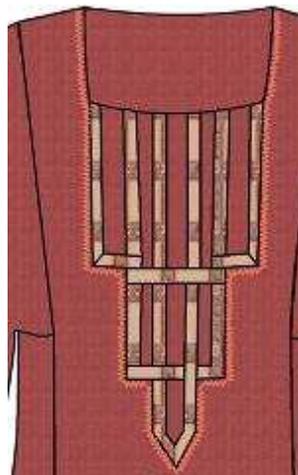
Figure 4.49: Revised Detail Red Mountain Chain Neckline Treatment – Final Evaluation

Description of Final Design

Red Mountain Chain design was comprised of a top and a skirt that was mainly inspired from Bani Salim tribe's Thawb and Bani Thaqeef Thawb. The colors of this design were inspired from reddish mountains typical in some areas of Hejaz and the color of sand. The style line was inspired from the most typical traditional Thawb that women wore in local tribes. A pleat on the skirt was functionally designed to allow for ease in movement. The plaid pattern in the skirt was inspired from the plaid embroidery patterns in the traditional dress. The same embroidery patterns appear in different parts of tribal women's wear including Thawbs and the headgear. The digitally designed textile also reflected the traditional embroidery, including zigzag patterns of Chain stitch. On the top, the decoration of the neckline was inspired from Bani Salim tribe's Thawb and Bani Thaqeef Thawb which had heavy embroidery with overlapping geometric lines in the neckline area. Chain stitch was implemented on the border of the decoration of the neckline with orange thread and touches of lead beads.

Final Textile Design
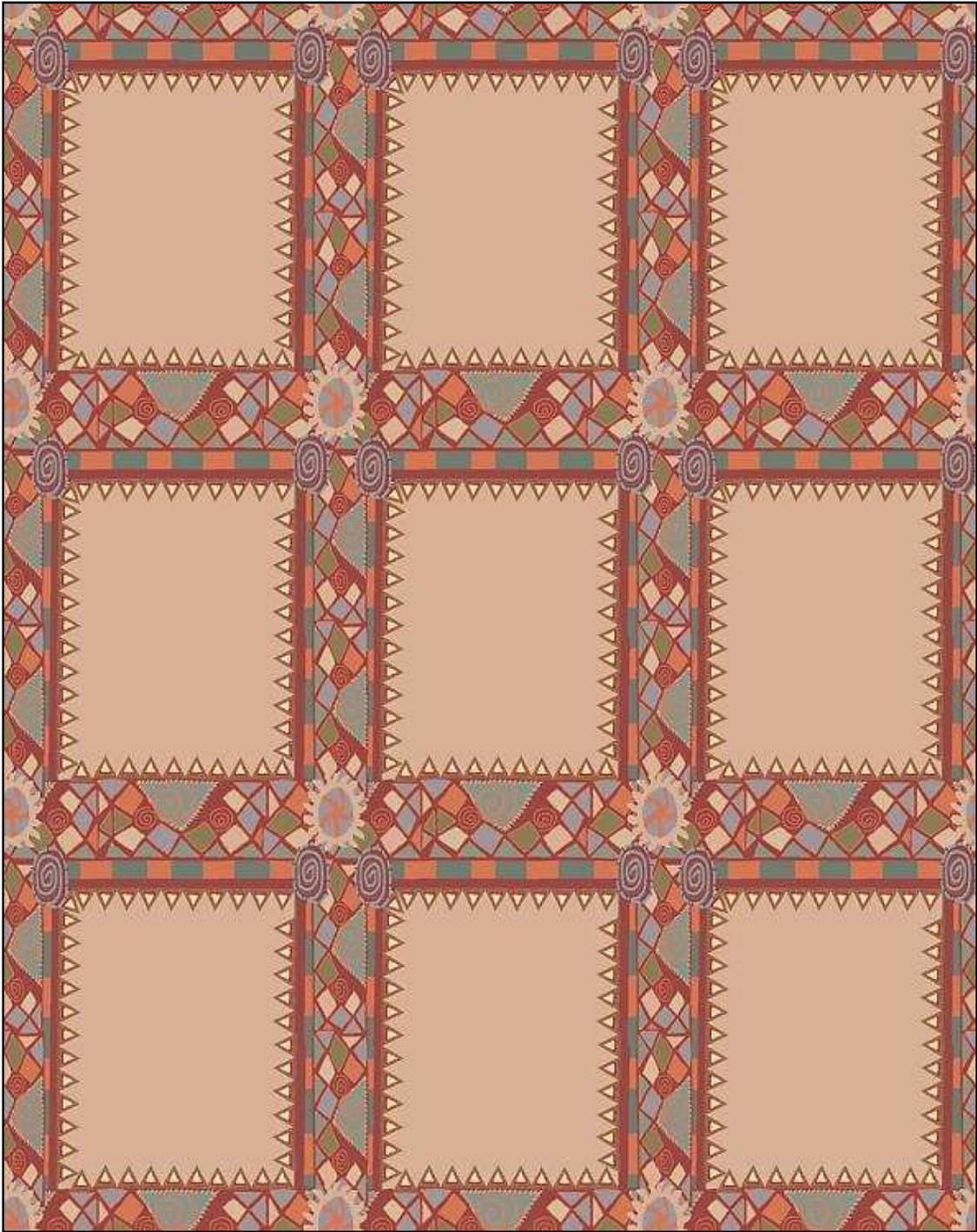
Figure 4.50:   Revised Red Mountain Chain Textile Design – Final Evaluation

Final Garment Design

Figure 4.51:   Final Red Mountain Chain Design– Final Evaluation
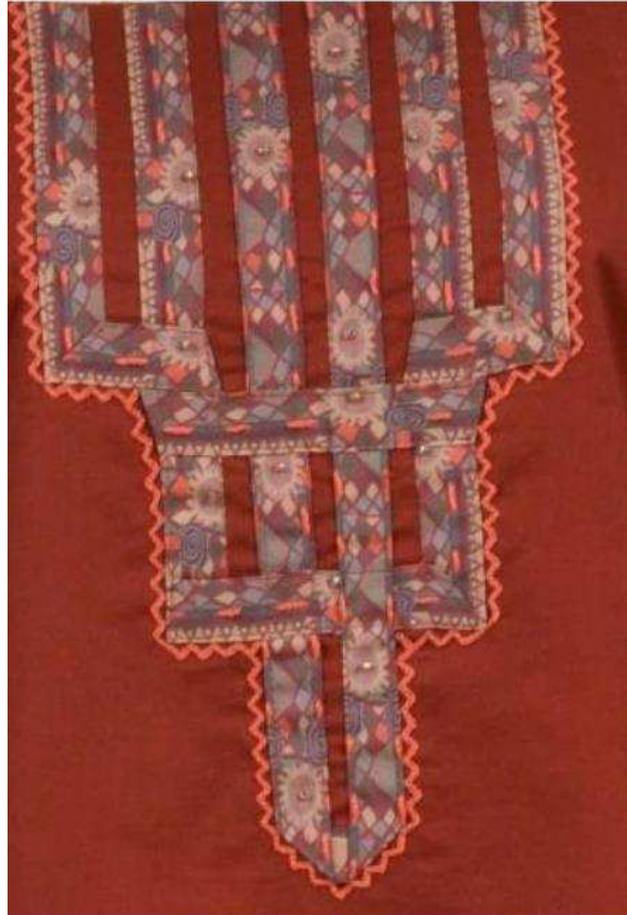
Figure 4.52: Final Red Mountain Chain Design with Appliqué Embroidery– Final Evaluation

Findings from Final Evaluation Survey

Descriptive statistics showed that Red Mountain Chain received a rating with a mean of 4.25 on the functional factor. It received a rating with a mean of 4.33 on the expressive factor. It also received a rating with the mean of 4.64 on the aesthetic factor from the participants.

Discussion

Changes in Red Mountain Chain were implemented in the aesthetic and expressive aspects of the garment. These changes were in fabric color, designed textile, and style line. A change in the style line was made for both aesthetic and functional purposes, which was

lengthening the pleat in the skirt. The design received the highest rating in terms of aesthetic aspects; however, the lowest rating was the functional aspect. This design had only one version with a skirt, which might be the reason for the low rating on functionality, as the participants preferred pants in terms of the functional aspects. According to (Green, 2001), comfort is basically what working women regard as the first priority when choosing workplace attire. Color contrast and simple style lines could have influenced the relatively high rating in the aesthetic aspects of this garment as the participants appreciated presenting ethnic identity in simple work attire. Interrelation of the aesthetic and expressive aspects was represented in the participants' appreciation of the aesthetic value of light embroidery along with the expressive aspect of the design.

Inspiration from Traditional Embroidery

Figure 4.53:   Al Jahdali Thawb

Figure 4.54:   Colorful Triangle Embroidery

Figure 4.55: Colorful V-Shapes Embroidery

Inspiration from Traditional Dress

Figure 4.56: Bani Thaqeef, Taif Region Thawb
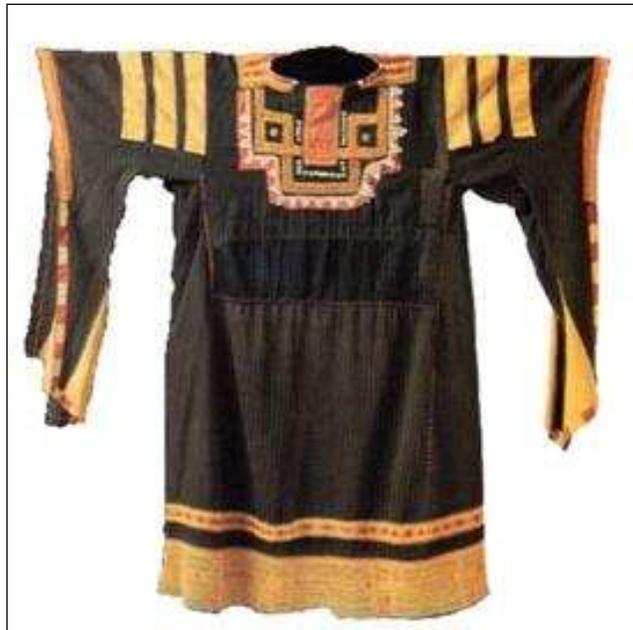
Figure 4.57: Bani Sulaim Tribe Thawb

Figure 4.58: Bani Sulaim Tribe Thawb
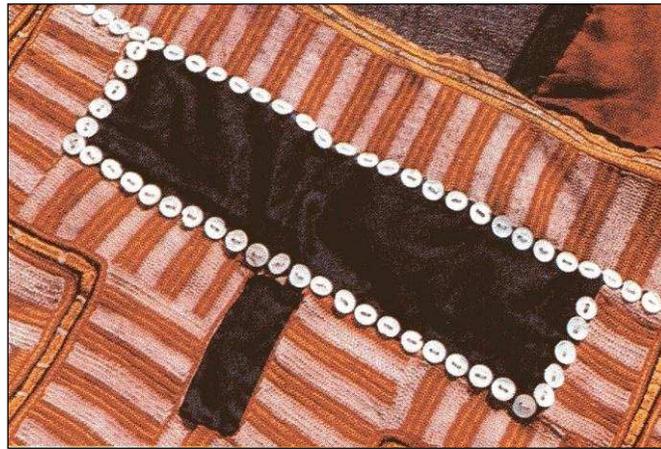
Figure 4.59: Neckline of a Hijazi Traditional Dress

Initial Textile Design

Figure 4.60:   Initial Desert Mirage Textile Design – Preliminary Online Survey

Initial Sketch of Garment Design
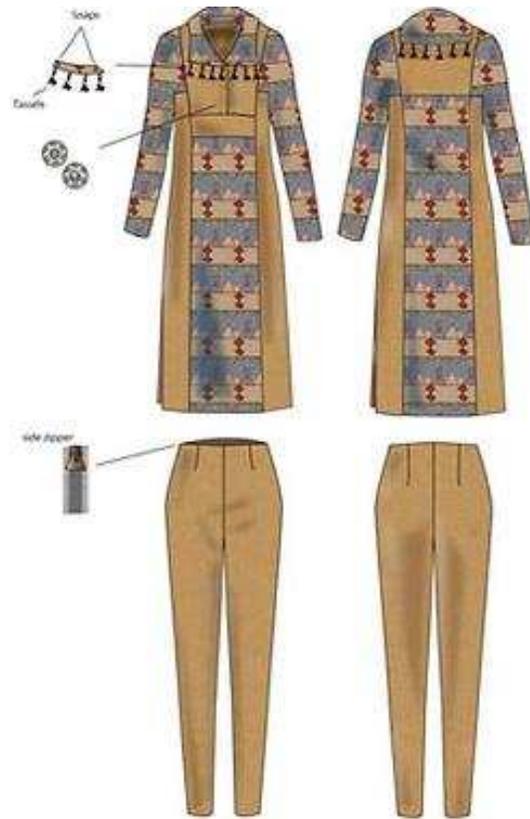
Figure 4.61:   Initial Illustration of Desert Mirage Design – Preliminary Online Survey

Findings from the Online Survey

Descriptive statistics showed that Desert Mirage Design received a rating with a mean of 3.88 on the functional factor, a rating with a mean of 4.14 on the expressive factor, and a rating with a mean of 3.75 on the aesthetic factor from the participants.

Design Refinement in Response to Preliminary Assessment

A version of this design with a skirt was produced. The top length was shortened and the collar and the placket were replaced with openings on both shoulders. The distribution of designed textile was changed with an emphasis in placement on the sides of the top. The solid khaki fabric was replaced with grey fabric.

Figure 4.62:   Revised Illustration of Desert Mirage Design – Final Evaluation

Description of Final Design

This design was mainly inspired from Harb Tribe. The colors and designed textile of this Desert Mirage design were inspired from the mountains and the sand in Hejaz. The grey color in this design was a variation of the black color that used to be the dominant color in most traditional Thawbs in the Hejaz. The style line was inspired from the typical traditional Thawb with more emphasis on the sides, sleeves and shoulder. A type of Chain stitch was used on the neck area along with mother of pearl buttons; this was inspired from Harb tribe's Thawb. The closure was on the shoulder with buttons and loop buttonholes. The stripes on the pants hem were inspired from the traditional Thawb. The Desert Mirage designed textile included the spiral shapes of Gob'a stitch along with triangles shapes of embroidery patterns.

Final Textile Design

Figure 4.63:   Revised Desert Mirage Textile Design – Final Evaluation

Final Garment Design

Figure 4.64:   Final Desert Mirage Design with Pants– Final Evaluation

Figure 4.65: Side View of Desert Mirage Design with Pants – Final Evaluation

Figure 4.66:   Final Desert Mirage Design with Skirt– Final Evaluation

Figure 4.67: Side View of Desert Mirage Design with Skirt – Final Evaluation

Figure 4.68:   Details of Desert Mirage Shoulder Treatment and Neckline Embroidery– Final
Evaluation

Findings from the Final Evaluation Survey

Descriptive statistics showed that Desert Mirage Design received a rating with a mean of

4.53 on the functional factor, a rating with a mean of 4.53 on the expressive factor, and a rating

with a mean of 4.61 on the aesthetic factor from the participants. Qualitative data showed that

participants #1, 2, and 3 preferred the pants for this design. Participant # 2 added, "I like the

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connection between the top and the pants using the same printed fabric". She also added that "Grey as background for the printed fabric is suitable for work attire". On the other hand, participants 5, 7, 8, and 12 preferred the skirt for this design.

Discussion

Desert Mirage design differed from the first illustration, as the researcher found that more traditional elements could be added to the design in order to enhance the ethnic appearance. Changes in this design were implemented in the aesthetic and expressive aspects, which included the style line, silhouette, distribution of designed textile, and solid color fabric in the garment. A change also was implemented in the functional aspects regarding garment components. The aesthetic aspect of the finished garment received the highest rating between the two other aspects whereas the expressive and the functional aspects received the same ratings.

Most participants appreciated the design with the pants. Aesthetically, there was appreciation for the distribution of the designed textile that showed a connection between the top and the pants. This preference also demonstrates a connection between the aesthetic and expressive aspects, as the traditional dress used to be decorated in the neckline area and hem line. This could imply a willingness to wear the garment and to present ethnic identity through it at work. Moreover, an interrelation was also represented in terms of the color of the garment. The grey color of the garment was appreciated aesthetically and expressively, as it was perceived to be appropriate for professional setting, which indicated an acceptance to wear the ensemble to work. Green and Kaiser et al., (2001) suggested that academic women look for clothes that look both formal and casual in terms of professional dress which is consistent with the findings in this research.

Red Sea Breezes Design

Inspiration from Traditional Embroidery

Figure 4.69: Colorful V-Shapes Embroidery

Figure 4.70: Red and Blue Bead Embroidery on Black Fabric

Inspiration from Traditional Dress

Figure 4.71: Harb Tribe Thawb
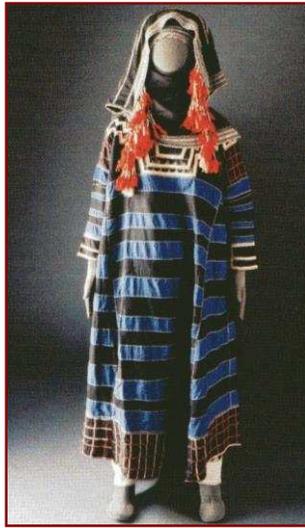
Figure 4.72: Bani Thaqeef, Ta'if Region Thawb

Initial Textile Design
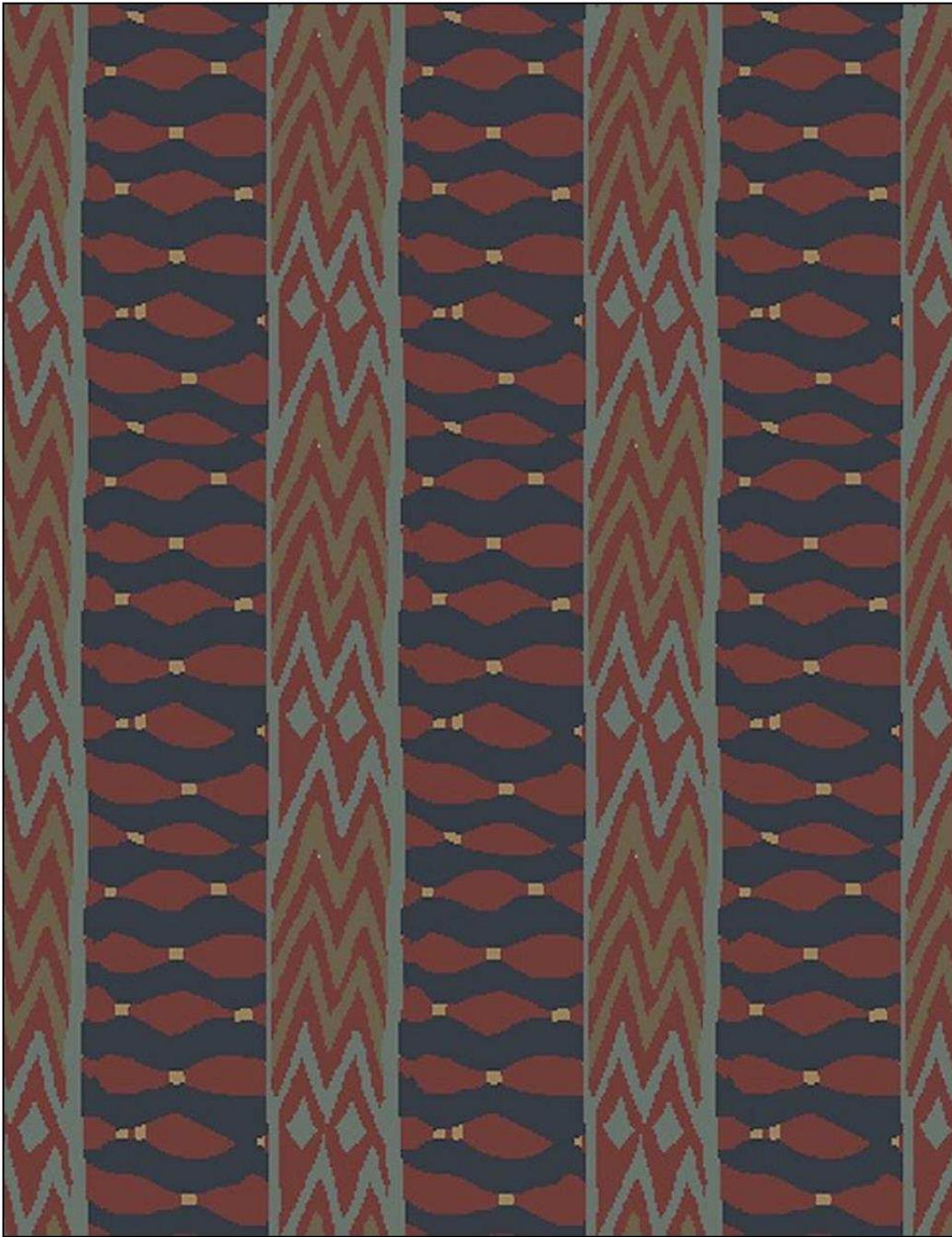
Figure 4.73:   Initial Red Sea Breezes Textile Design – Preliminary Online Survey

Initial Sketch of Garment Design

Figure 4.74:   Initial Illustration of Red Sea Breezes Design – Preliminary Online Survey

Findings from the Online Survey

Descriptive statistics showed that Red Sea Breezes Design received a rating with a mean of 3.44 on the functional factor, a rating with a mean of 3.38 on the expressive factor, and a rating with a mean of 3.28 on the aesthetic factor from the participants.

Design Refinement in Response to Preliminary Assessment

The color of the solid dark blue fabric in the Red Sea Breezes design was replaced with lighter shades of blue fabric. The textile design was eliminated and replaced with a designed textile that had more contrast. The placket in the front remained with no collar. In addition, traditional style lines replaced the style line of top in the first Illustration.
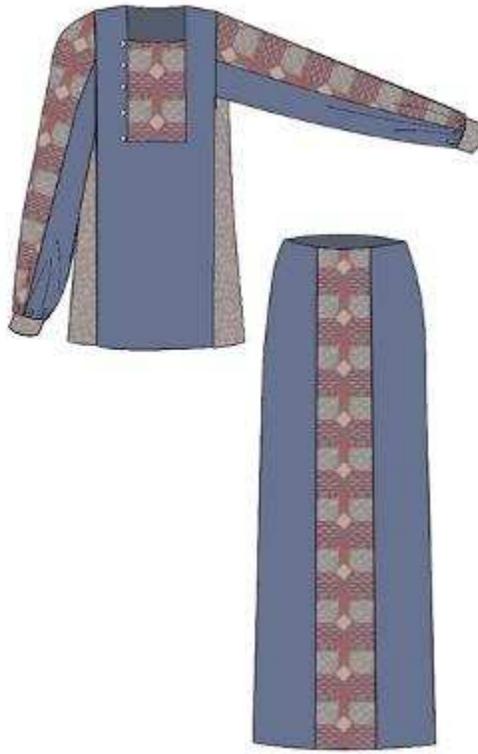
Figure 4.75:   Revised Illustration of Red Sea Breezes Design – Final Evaluation
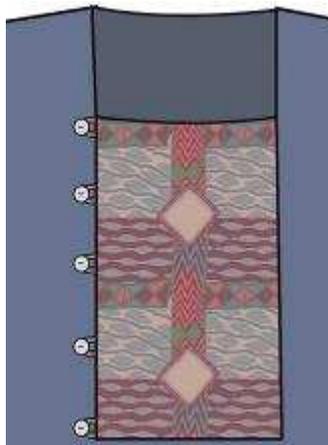
Figure 4.76:   Detail of Red Sea Breezes Neckline Treatment – Final Evaluation

Description of Final Design

      This design was comprised of a top and a skirt which were mainly inspired from Harb tribe. The colors and textile design were inspired from the shape of red sea waves and the color of the sand in the Hejaz. The Red Sea Breezes digital textile design was integrated with colorful embroidery in triangle shapes, which in the traditional garments used to be filled with stitches like Chain and Fly stitch. The diamond shapes in the Red Sea Breezes designed textile represented the appliqué that was used as a border with embroidery stitches such as blanket stitch in the typical traditional dress. The style line was inspired from the typical Hejazi dress and the neckline style line that was inspired form Harb tribes' Thawb. The neckline style was embellished with mother of pearl buttons. A touch of embroidery was implemented on the neckline using blanket stitch with lead beads. The embroidery defined the shape of an appliqué that was seen in the traditional dress.

Final Textile Designs
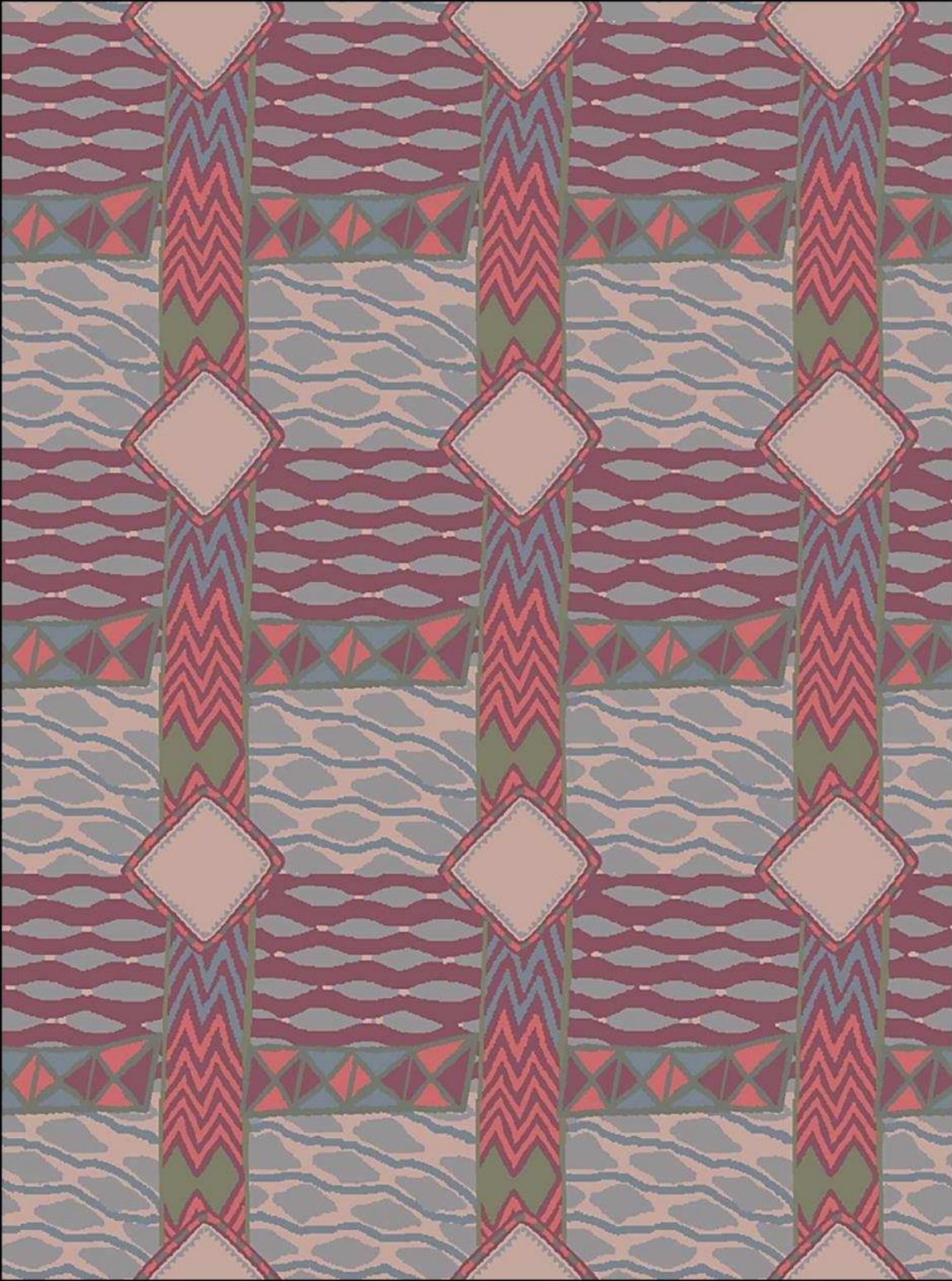
Figure 4.77: Revised Red Sea Breezes Textile Design 1 – Final Evaluation
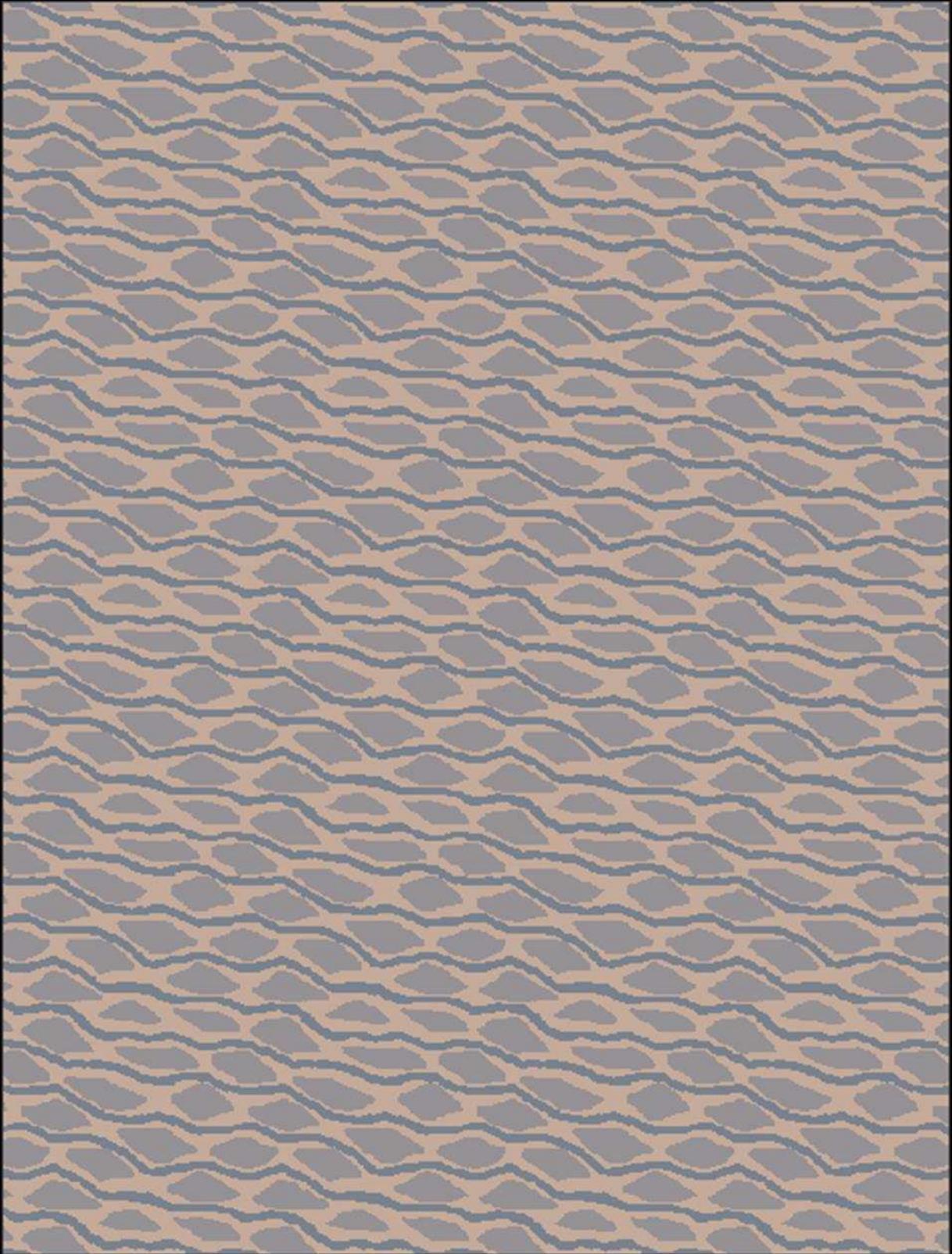
Figure 4.78:   Revised Red Sea Breezes Textile Design 2 – Final Evaluation

Final Garment Design

Figure 4.79:   Final Red Sea Breezes Design– Final Evaluation

Figure 4.80: Side View of Red Sea Breezes Design and Embroidery Detail – Final Evaluation

Findings from the Evaluation Survey

Descriptive statistics showed that Red Sea Breezes received a rating with a mean score of 4.50 on the functional factor, a rating with a mean of 4.50 on the expressive factor, and a rating with a mean of 4.58 on the aesthetic factor from the participants.

Discussion

      Changes implemented in the Red Sea Breezes design included aesthetic aspects that were related to fabric color, designed textile, and style lines. The functional change was implemented in terms of garment components. The design received the highest rating in the aesthetic aspect, while the expressive and functional aspects of the design received the same ratings. The contrast in color between the solid fabric and the designed textile were appreciated aesthetically. The relatively light color of the garment was also appreciated as participants showed their interest in light colors for work attire to be acceptable. Color is considered as one of the most important elements of the design, as mentioned in one of the projects by Lamb and Kallal (1992), where color options were of importance to participants when it came to their attitude about wearing wear pink.

Hejazi Waves Design

Inspiration from Traditional Embroidery

Figure 4.81: Red and Blue Bead Embroidery on Black Fabric

Figure 4.82: Colorful Triangle Embroidery

Figure 4.83: Red and Blue Bead Embroidery on Black Fabric

Inspiration from Traditional Dress
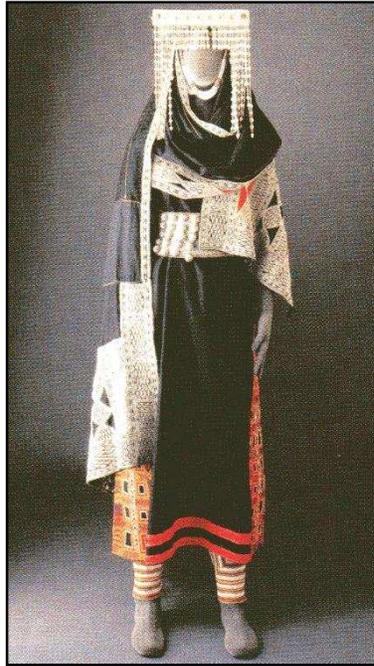
Figure 4.84: Bani Sa'ad, Ta'if Region

Figure 4.85: Jahdaly Thawb

Initial Textile Design
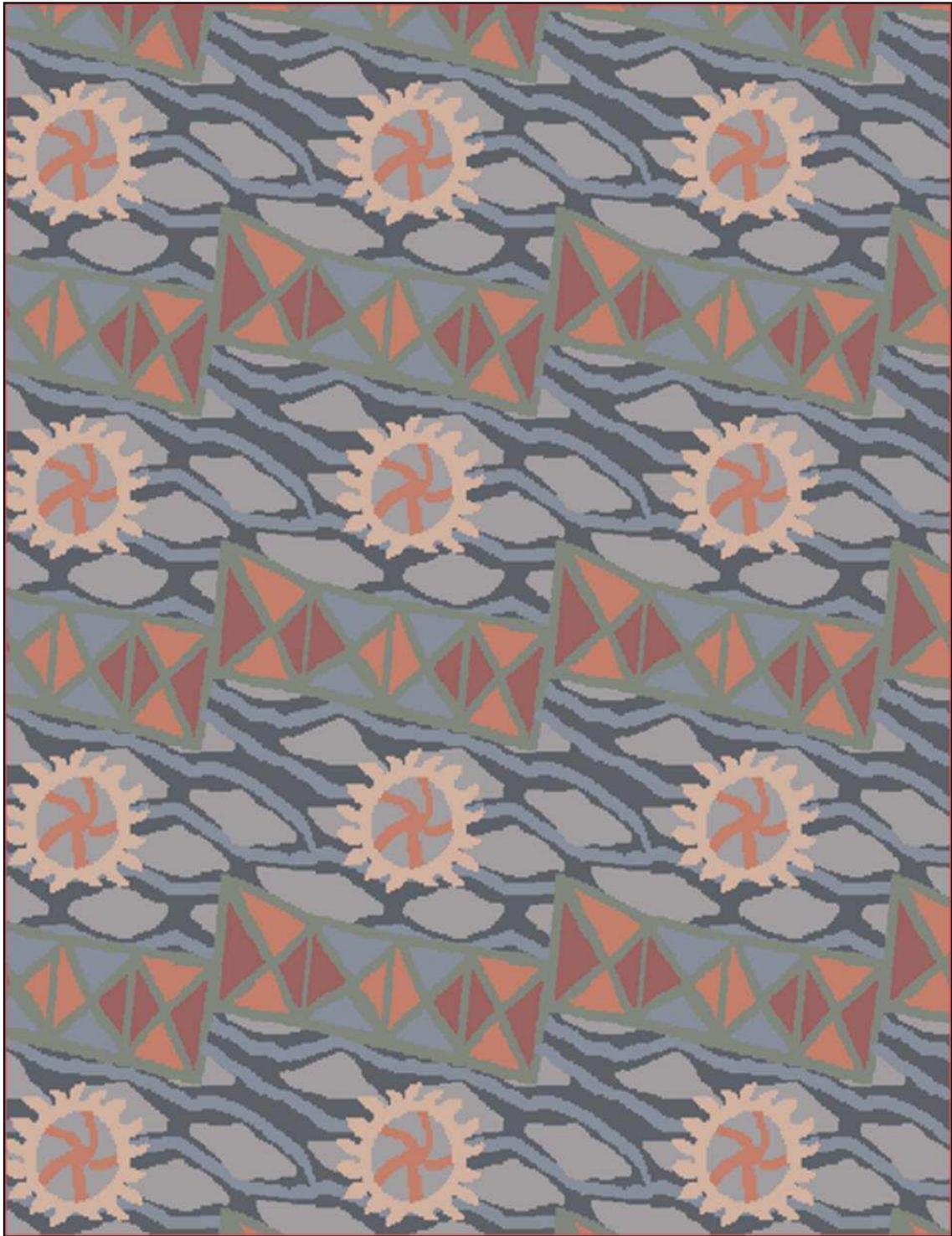
Figure 4.86:   Initial Hejazi Waves Textile Design – Preliminary Online Survey

Initial Sketch of Garment Design

Figure 4.87:   Initial Illustration of Hejazi Waves Design – Preliminary Online Survey

Findings from the Online Survey

Descriptive statistics showed that Hejazi Waves Design received a rating with a mean of 3.88 on the functional factor. Hejazi Waves design received a rating with a mean of 3.63 on the expressive factor. It received a rating with a mean of 3.50 on the aesthetic factor from the participants.

Design Refinement in Response to Preliminary Assessment

The solid coral fabric of this design was replaced with black fabric. The Hejazi Waves designed textile was exchanged with another one that better matched the black background. The neckline was implemented without the collar. Traditional style lines were used in the top,

changes included lengthening the top and narrowing the pant width. Gathering in sleeve cuffs were revised into regular sleeve openings.

Figure 4.88:   Revised Illustration of Hejazi Waves Design – Final Evaluation

Figure 4.89:   Revised Illustration Detail of Hejazi Waves Neckline Treatment – Final Evaluation

Description of Final Design

The Hejazi Waves design was comprised of a top and a pair of pants. The black dominant color was inspired from traditional Harb tribe's Thawb, where black used to be a dominant color and served as a background for the embroidery. Other colors in the design were inspired from the embroidery colors in the traditional Thawb. The style line was inspired from the traditional Thawb for the long top. The neckline included gathered fabric that ended with embroidered textiles to reflect the emphasis of embellishment in the traditional dress with heavy embroidery or jewelry. The embroidery on the neckline area was bordered with Chain stitch, lead beads and mother-of-pearl buttons on the front placket. The Hejazi Waves designed textile reflected shapes of waves that used to be seen in the traditional Thawb, worked with lead beads and Chain stitch in blue or red color thread along the waves. Combined with the waves was the zigzag patterns in the traditional Thawb that used to be filled with embroidery stitches, in addition to appliqué shapes bordered with stitches such as blanket stitch.

Final Textile Design

Figure 4.90:   Revised Hejazi Waves Textile Design– Final Evaluation

Final Garment Design

Figure 4.91: Final Hejazi Waves Design with Skirt– Final Evaluation

Figure 4.92: Side View of Hejazi Waves Design with Embroidery Detail – Final Evaluation

Findings from the Final Evaluation Survey

Descriptive statistics showed that Hejazi Waves received a rating with a mean of 4.47 on the functional factor, a rating with a mean of 4.89 on the expressive factor, and a rating with a mean of 4.31 on the aesthetic factor from the participants. Qualitative data showed that participant #1 thought that the design was very wonderful, more specifically participant # 2 mentioned that style lines were very beautiful, she added that "The use of lead beads and embroidery add aesthetic value". On the other hand, participant #12 commented, "I did not like the design of the neckline"; in addition, participant # 3 suggested, "black is related to sadness, I

don't prefer it. I prefer the orange as an alternative color for this design because it is a more sociable color". Moreover, participant #10 and #12 commented that the colors in the printed fabric seemed faded.

Discussion

Changes in the Hejazi Waves design were implemented in the aesthetic aspects including fabric color, designed textile style lines, and silhouette. The expressive aspect was the highest in the garment's rating. There was appreciation for this design as the color of solid fabric and designed textiles used were similar to traditional Thawb. This appreciation implied an interrelationship between the aesthetic and expressive aspects, in terms of the appreciation of the designed look. This is consistent with what Lamb and Kallal (1992) found regarding interrelations between the aesthetic and the expressive aspects of design. The expressive ~ aesthetic connection related to the message conveyed by apparel, and how the beauty of the garment could enable a wearer to obtain pleasure from wearing it. The lowest rating was obtained in the functional aspect. A dislike was expressed regarding neckline style line and the black color of the garment, as participants expressed their desire for light colors in work attire. They also valued hand embroidery in both aesthetic and expressive aspects, as it showed that the dress was appealing and acceptable for presenting ethnic identity.

Inspiration from Traditional Embroidery

Figure 4.93: Colorful Triangle Embroidery

Figure 4.94: Colorful V-Shapes Embroidery

Inspiration from Traditional Dress

Figure 4.95: Jahdaly Thawb

Figure 4.96: Harb Tribe Thawb

Initial Textile Design
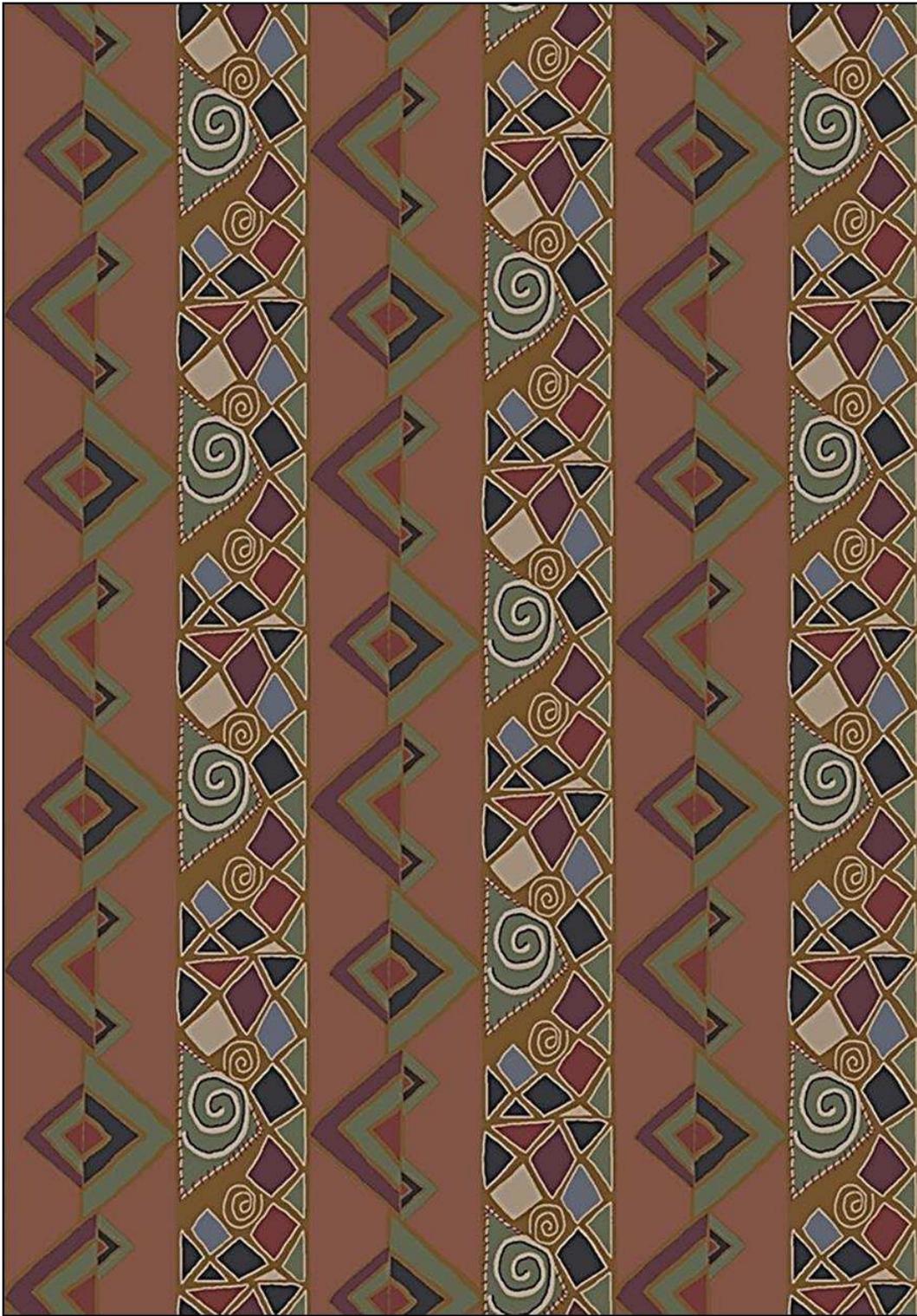
Figure 4.97: Initial Hejaz Coral Textile Design – Preliminary Online Survey

Initial Sketch of Garment Design

Figure 4.98:   Initial Illustration of Hejaz Coral Design – Preliminary Online Survey

Findings from the Online Survey

Descriptive statistics showed that Hejaz Coral Design received a rating with a mean of 3.71 on the functional factor, a rating with a mean of 3.50 on the expressive factor, and a rating with a mean of 3.41 on the aesthetic factor from the participants. Qualitative data showed that participant # 5 suggested, "I liked the upper part but the lower was not satisfying".

Design Refinement in Response to Preliminary Assessment

The background colors of this design were changed for more contrast; the silhouette and the style lines were changed by lengthening the top and narrowing the width of the pants. The style line was also changed with the addition of the horizontal traditional lines in the top and the pants.

Figure 4.99: Revised Illustration of Hejaz Coral Design – Final Evaluation

Description of Final Design

The Hejaz Coral design was comprised of a long top with pants that were mainly inspired from Jahdaly tribe. The colors and shapes in the Hejaz Coral designed textile were inspired from the nature of Hejaz. This inspiration came from the red sea corals, and beige and brown sands and mountains in the Hejaz along with orange shades inspired from the original Thawb. Both designed textiles involved triangles with spiral shapes that reflect the shape of Gob'a stitch. A

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type of Jahdaly tribe Thawb in the Hejaz was the inspiration for the length of the top. This kind of Thawb used to be worn above the ankle with pants underneath. That length allowed embroidery and decoration in the cuffs of the pants to be exposed. The plain neckline area was inspired from traditional Thawb of Hijaz that used to be decorated with necklaces and jewelry. The horizontal style lines in this design were inspired from the Jahdaly tribe Thawb. A closure located in the shoulders was traditionally inspired, and was functionally meant to allow for more ease in donning and doffing the top. In the Hejaz Coral design the digitally printed textiles were situated in places that had embroidery in the original Thawb, such as at the hem of the top, the sleeves, and pant cuffs. Motifs in the designed textile included zigzag shapes of Chain stitch, and the use of appliqué. On the top, beads were added for embellishment.

Final Textile Designs

Figure 4.100:   Revised Hejaz Coral Textile Design 1 – Final Evaluation

Figure 4.101: Revised Hejaz Coral Textile Design 2 – Final Evaluation

Final Garment Design

Figure 4.102:   Final Hejaz Coral Design– Final Evaluation

Figure 4.103: Side View of Hejaz Coral Design and Top Embellishment– Final Evaluation

Findings from the Final Evaluation Survey

Descriptive statistics showed that Hejaz Coral Design received a rating with a mean of 4.39 on the functional factor, a rating with a mean of 4.00 on the expressive factor, and a rating with a mean of 4.28 on the aesthetic factor from the participants.

The qualitative results revealed that one of the participants thought that the length of Hejaz Coral, the longest top among the eight garments, was not reflective of the traditional dress length. She suggested that it would be more acceptable if the top was either shorter or a dress

length. Also, two participants (participant #10 and 12) preferred the printed fabric, which was on the hem of the top, to be on the neckline area instead. While participant # 2 suggested "the design has wonderful colors in high harmony and unity".

Discussion

The changes in the Hejaz Coral design were implemented in the aesthetic aspect, including fabric colors, silhouette, and style lines. The expressive aspect received the highest rating in this garment although the lowest rating was in the aesthetic. There was a preference for the designed textile on the neckline area of the top instead of the hem. Although traditional Thawbs had various style lines and embellishments, the typical traditional dress used to be embellished in the neckline area and that might explain the preference for the designed textile to be used in that location. This direct feedback from the participants was beneficial with regard to co-designers input as end-users assessing the product concepts, which enabled producing more on-point products which met consumer expectations (Morris, 2011). Response to Hejaz Coral design also implied participant's willingness to present ethnic identity through work attire.

In the following pages are the tables that included the mean differences across the eight designs in the concept development phase and the mean differences across the eight finished garments in the final evaluation phase. Garments were measured on two Likert scales from 1 not satisfying to 5 excellent, and from 1 strongly disagree to 5 strongly agree. In general, the scores in the first survey were lower on all FEA aspects compared to the final evaluation survey. Statistical analysis of the data in the tables validates that the participants accepted the designs in presented in this research. (Tables 4.1 & 4.2)

Table 4.1   Preliminary Evaluation of Garments According to FEA Attributes

FEA Model			
Design	Functional	Expressive	Aesthetic
Silver Waves	4.13	3.63	3.69
Hejaz Gob'a	4.13	3.63	3.28
Green Palms	3.81	3.75	3.53
Red Mountain Chain	4.19	4.25	4.25
Desert Mirage	3.88	4.14	3.75
Red Sea Breezes	3.44	3.38	3.28
Hejazi Waves	3.88	3.63	3.50
Hejaz Coral	3.71	3.50	3.41

Table 4.2 Final Evaluation of Garments in this Study According to FEA Attributes

FEA			
Garment	Functional	Expressive	Aesthetic
Silver Waves	4.69	4.69	4.86
Hejaz Gob'a	4.44	4.56	4.72
Green Palms	4.47	4.22	4.64
Red Mountain Chain	4.25	4.33	4.64
Desert Mirage	4.53	4.53	4.61
Red Sea Breezes	4.50	4.50	4.58
Hejazi Waves	4.47	4.89	4.31
Hejaz Coral	4.39	4.00	4.28

Paying for Culturally Inspired Garments

Results from the first preliminary online survey showed that the mean amount participants were accustomed to pay for workplace attire per year was approximately (M= $ 614.33) as of 2014. All monetary amounts in the first and second surveys were converted from the Saudi Riyal into U.S. Dollars ($1.00 USD =3.74927 Saudi Arabia Riyal) retrieved from www.XECurrencyConverter.com.

In the final evaluation survey, statistical results showed that the participants were willing to pay more for culturally inspired work attire than they were accustomed to spending for Western style professional clothing. This finding demonstrates that the research met Objective 2 which was to: Measure the extent to which Saudi female academics would be willing to pay for a culturally inspired form of professional dress.

Study participants reported that they usually spend up to $100.00 on the usual work attire with a mean of $ 67.14 (see Table 4.3). When presented the eight garments in this study, participants were willing to pay up to $ 266.00 for Silver Waves design with a mean of $112.00. Moreover, results showed that Hejaz coral design received the lowest amount that participants were willing to pay which was $ 40.00 with a mean of $ 81.50. Qualitative data further suggested that the participants associated the amount they might pay with embroidery, and they generally thought that they would prefer less embroidery to keep garments affordable. Payment in any currency varies with the economic conditions. The results shown in this study refer to payment during 2014 and 2015 which included the first and final phase of the study.

Table 4.3: Amounts Participants Would Pay for Culturally Inspired Garments

	Minimum in U.S. Dollars	Maximum in U.S. Dollars	Mean
Usual work attire	$40.00	$100.00	$67.14
Silver waves	$40.00	$266.00	$112.00
Hejaz Gob'a	$26.00	$186.00	$97.50
Green palms	$26.00	$266.00	$95.75
Red mountain Chain	$40.00	$266.00	$105.17
Desert mirage	$26.00	$213.00	$96.33
Red sea breeze	$26.00	$266.00	$87.33
Hejazi waves	$26.00	$320.00	$101.55
Hejaz coral	$40.00	$133.00	$81.50

Qualitative Findings from the Focus Group Session

The focus group approach was implemented in the final evaluation phase. Before the discussion, questionnaires were distributed to the participants with questions for each of the eight designs which were presented as a slide show. The finished garments were available for the participants to touch and see during this phase of data gathering. An informal discussion followed, and was tape recorded. Data from the discussion was in Arabic, transcribed by the researcher, and then professionally translated in Jeddah, Saudi Arabia.

Constant comparison method was used to analyze the data from the focus group discussion. The researcher coded the official transcription for the process of developing open codes. Working with a co-coder, inter-rater reliability was achieved with 21 codes emerging. The researcher narrowed the codes to 12. From these 12 codes, themes emerged, see (Figure 4.70). The main goal in analyzing the themes was to answer the main question of the research, which was: Would Saudi female academics be willing to wear work attire that has traditional design elements?

Participants' opinions about the garments presented from this study were categorized, and led to three main themes: 1) self-presenting ethnic identity as a professor in academic culture, 2) self-presenting identity as modern or contemporary, 3) and interest in versatile work attire (See Figure 4.104).
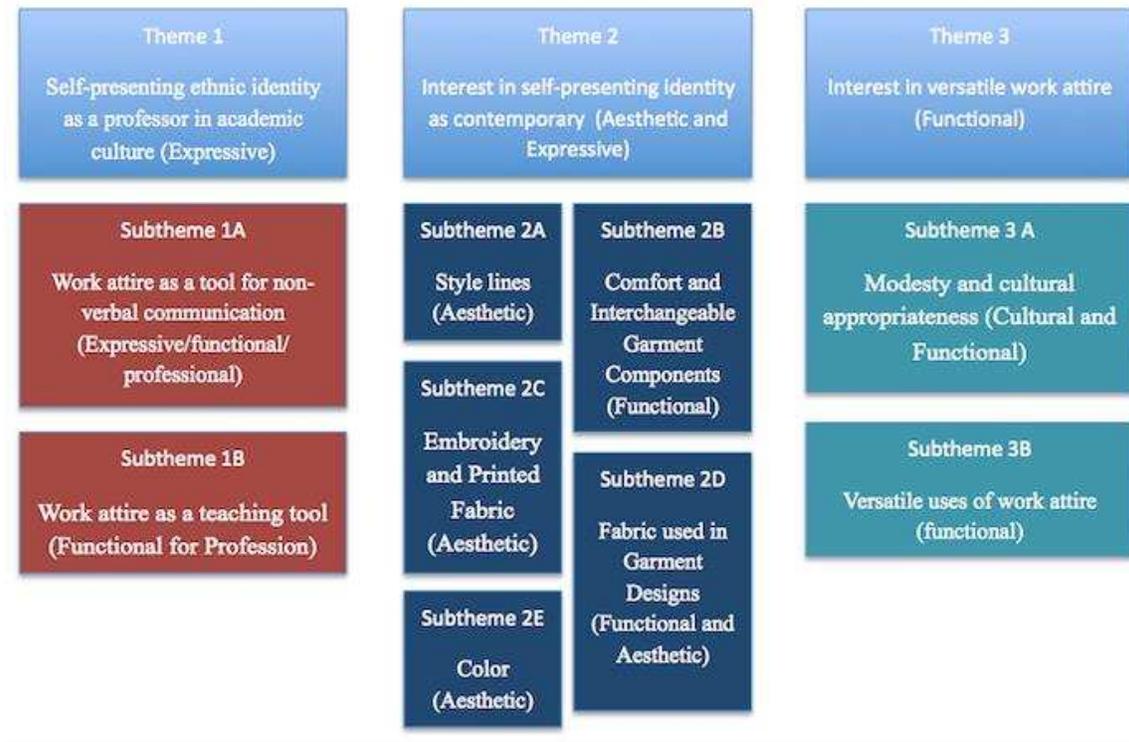
Figure 4.104: Framework of themes and subthemes in this research

Self-Presenting Ethnic Identity as a Professor in Academic Culture (Expressive)

Work Attire as a Tool for Non-Verbal Communication (Expressive/Functional/

Professional)

Saudi female academics are accustomed to wearing work attire that is available for purchase in the Saudi market. Their usual work attire is considered to be global or Western, as it is relatively simple, convenient and affordable. Participants demonstrated varying levels of interest in presenting their ethnic identity within the academic professoriate by wearing the proposed garments from this study. Participants were asked about any changes they would like to see on the garments from this study, in order to make them wearable at work, in terms of the expressive aspects of design.

"This work has revived something that died out and will try to maintain our identity" Participant (Participant10).

"Yes, in a new way" (Participant 11) *"this work has revived a matter that has been buried for a long time and you will not find it in the market so far. All garments at the markets are copied from Western designs, or whatever is global. Local garments will not be worn by the growing generation, but when it is functionalized in a new way, they will be attracted to them, since the values are still within us even if we go away, still within us, but we want to see what attracts us. The design line is the thing that will attract us since the idea is heritage but it is functionalized in a contemporary way".* (Participant 11)

The previous quotes show how participants explained that wearing the garments would be significant in presenting identity as contemporary, and that would be acceptable in this modern time. It also showed the value that up-and-coming generations might find in the Saudi market and how they would perceive heritage. The modernized point of view implied the participants' interest in presenting their cultural identity, and to communicate within the culture non-verbally.

The participants mainly specialized in teaching within the apparel design major, where clothing is the focus of the department from different perspectives. Some participants thought of their specialization as critical when they chose attire for work. When participants were asked about their favorite attire for work, and if they would wear any of the proposed garments one of the participants stated:

> *"If my specialization were not in apparel design, my dressing would be more open. I would be proud, if I wore this clothing daily and this would be communicated to the students".* (Participant 12)

The previous quote showed participant consideration of their work attire as they work in the apparel design field. The participant mentioned how her specialization in apparel design has affected her choices and habits of dressing in terms of self-perception and non-verbal self-presentation.

Work Attire as a Teaching Tool (Functional for Profession)

Most of the faculty wore Western clothing that was simple, affordable, and readily available in the Saudi market. Their students study traditional dress in both theoretical and practical class subjects. Most participants supported the idea of wearing the garments designed in

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this study, because the garments would familiarize students with the traditional Saudi dress that was worn in the past. Participants were asked if they thought that wearing any of the garments from this study would be meaningful for presenting heritage.

"The designs are for academics who deal with young students, and by wearing garments that have inspiration from traditional dress, students' eyes would get used to them... They are a group that forgot the heritage". (Participant 7)

This quote showed that the participant thought that these garments would be a good tool to inform students about lost heritage since current students are not familiar with it. In addition, seeing the inspiration existing in real life would familiarize the students with the overview of Saudi traditional dress. This demonstrated the professorial role of participants as they communicated regularly with the students in teaching apparel design subjects, and how dress could be helpful in teaching students about traditional Saudi dress.

Adding to the previous idea of familiarizing students with an overview of Saudi traditional dress by participants wearing garments form this study, some participants thought about the matter in more depth in terms of the use of embroidery stitches and patterns of the designed textiles. Those stitches and patterns were the dominant features of the inspiration from the traditional dress; subsequently, some participants thought that wearing the garments from this study would be useful as a teaching tool. Participants were asked if they thought that wearing any of the garments from this study would be meaningful for presenting heritage.

"Yes, this has an importance, since as we wear these garments, it will be an identification for the coming generations and will arouse the students' curiosity to know the design nature and source, 'what are these stitches, what are these shapes?', they will ask and know, bit by bit...it will be a means of identification". (Participant 11)

"Yes, wearing garments like these would capture students' attention and they will know what the inspiration was and when they were worn". (Participant 4)

These quotes showed that participants considered the importance of the details in the designs. And further, that the digitally designed textiles reflected the patterns of the traditional embroidery in a way that could function as a teaching tool in the communication with the students.

When answering the same question about the meaningful aspects of wearing the garments, some participants perceived that wearing the garments from this study would capture the students' attention, and that that was something important. Also, the KAU design curriculum includes multiple subjects where the design process is emphasized. The garments in this study show the traditional Saudi approach to embroidery, and also show how digital design technology can be used to create a contemporary version of the traditional textile designs.

"By wearing these garments, the students will ask and they will have curiosity to know these designs, as it is the core of their specialization" (Participant 10).

This quote represented how the participant thought that the garments would inspire and perhaps energize students to focus on the design process in their design class subjects. When answering the same question about the meaningful aspects of wearing the garments as role

models in teaching and mentoring students within the apparel design field, some participants thought that wearing the proposed garments would work as support for inspiring students.

"When I teach the subject of traditional dress while wearing modernized traditional clothes during my lectures it will strengthen the students' love for the subject, and innovation and expand their limited viewpoints. It is not only a dress, but it has psychological effects here within the department of clothing and textiles". (Participant 12)

In this quote the participant showed the significance of the oral communication between the faculty and the students, and the professorial role in inspiring passion for the subject in the students. She also mentioned how this passion would affect the communication within the department.

When answering the same question about the meaningful aspects of wearing the garments, participants mentioned incorporating the new design and printing technology as a subject being taught in the classes.

" The clothing and textiles department can develop the traditional image of Thawb and Jalabya further than students can imagine. They see traditional designs that have been functionalized by new technology and appealing clothes that inspire them to create and innovate. This is so important for their specialization. If I taught this concept without applying it to myself, it wouldn't convince them". (Participant 5)

This quote showed the participant's interest in how wearing the proposed clothing would support teaching an approach to the use of new technology for design and printing fabric combined with the traditional dress. And also indicated that to "walk one's talk" would be useful as a design professor.

Discussion

The previous participant quotations provide support of their willingness to wear the garments from this study, and offer confirmation of meeting research objective 3, which was to: measure the extent to which Saudi female academics are willing to wear cultural ethnic dress visually related to the tribal area in which they live, in this time period that is influenced by standardized western clothing in the global marketplace.

Participants' interest in self-presenting cultural or ethnic identity is interrelated with the FEA needs of work place attire. Cultural consideration must be considered by designers when collecting information about consumer needs. Dress is considered a means of non-verbal communication, which includes symbolic aspects of dress that consumers use as a way to convey messages about themselves (Lamb and Kallal, 1992).

The previous findings also showed participants' consideration of self-presentation especially with the students in academia. This perception of themselves as role models was presented in two aspects: how their appearance would familiarize students with traditional motifs which might help revive lost heritage, and how their appearance would help as a teaching tool within the design class subjects. Saudi females consider cultural appropriateness when making decisions regarding dressing for different occasions; this consideration is managed by the various others who would see and communicate with them (Tawfiq, 2012).

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The participants who work in the apparel design field in Saudi Arabia are relatively aware of global contemporary fashion trends. The traditional Thawb is worn only for special occasions, and participants showed varying levels of interest in presenting their ethnic identity in a contemporary way within the professional culture by wearing the garments from this study to work.

Style Lines (Aesthetic)

Traditional dress used to be loose with long sleeves which suited women's life style in the past, but is not practical for contemporary academics' life style. Participants showed relatively high level of interest in wearing the garments from this study when they were asked if they would wear any of the garments and why.

> *"I appreciated how the designs are transformed from the Thawb design into tops, I really appreciate that".* (Participant 12)

The previous quote showed how the participant thought that the garments looked contemporary due to transforming the style of the Thawb into tops as separates, which could be worn with skirts or pants instead of the long, one-piece traditional Thawb.

In addition, traditional dress was designed in typical style lines that are not used in contemporary dress or work attire typically worn by the participants. They were asked about their feelings when they wear a traditional Thawb for special occasions, and how they might feel if they wore any of the garments from this study to work.

"If I wear any of the presented garments rather than wearing the traditional Thawb, I would feel that I'm traditional and consistent with fashion along with the feeling of psychological comfort and country affiliation". (Participant 7)

The previous quote showed that the participant would accept wearing any of the garments from this study, as they looked traditional and modern at the same time. She also appreciated how wearing any of the presented garments would influence her inner feelings which related to comfort and cultural affiliation. Moreover, the garments from this study were not as loose as the traditional Thawbs, even though the garments from this study were not very closely fitted to the body. Participants were asked about their opinion of the garments in general.

"The designs are not tight on the body, and they do not show its details, so they are suitable for any person". (Participant 9)

The previous quote showed that the participant appreciated the fitting of the garments from this study as they were not too fitted to the model, and that this fit made the presented garments culturally acceptable. Also, the presented garments were inspired from the traditional style lines and embroidery patterns, and were represented and modernized in the digitally designed textiles. Participants were asked about any changes they would like to see on the presented garments in order to make them wearable at work in terms of the aesthetic aspects of design.

"The best thing is the idea, the design lines are the thing that will attract us, since the idea is heritage but it is functionalized in a modern way". (Participant 10)

The previous quote showed that the participant emphasized the idea of incorporating inspiration from traditional style lines into the garments, and from the traditional motifs into the designed textile. In contrast, one participant preferred different style lines from those which made the garments look traditional.

> *"It is nice to get inspiration from the heritage but to functionalize it in the contemporary design lines that we wear, not the traditional".* (Participant 1)

The previous quote showed the participant's point of view about the printed fabric; she thought that the printed fabric that represented heritage was appealing, but it should be used in garments that have Western style lines.

Comfort and Interchangeable Garment Components (Functional)

Following the dress code for an academic professional setting, the participants usually wear long skirts or pants and relatively long tops with pants for work. Participants were asked about any changes they would like to see on the presented garments in order to make them wearable at work in terms of the functional aspects of design.

> *"To be practical (the presented garments), I would prefer the tops to be longer and worn with pants".* (Participant 11)

In the previous quote, the participant implied that she preferred all the presented garments to be comprised of long tops and pants instead of skirts. This implied the consideration for cultural appropriateness along with comfort for work attire. Another participant emphasized the previous idea.

"All the upper parts are comfortable, and I would prefer the skirts to be replaced with pants". (Participant 10)

This quote also emphasized the preference for pants along with showing satisfaction about the perceived comfort of the tops of the presented garments.

Interchangeable garment components were mentioned when the participants were asked about any changes they would like to see on the presented garments in order to make them wearable at work in terms of the aesthetic aspects of design.

"Designs with pants look better". (Participant 12)

The participant implied that the components of the presented garments with pants were perceived as to be stylish as well as comfortable.

Embroidery and Printed Fabric (Aesthetic)

All of the quotations that follow in this sub-theme provide evidence that research objective 4 was met. Research objective 4 was to: measure the extent to which Saudi female academics would value hand embroidery in this era of technology.

Traditional Thawbs used to be heavily embellished with embroidery and other materials, and the thread colors used in embroidery were bright. Participants showed interest in the use of printed fabric to replace the heaviness of traditional embroidery. Participants were asked if they thought that wearing any of the presented garments would be meaningful for presenting heritage.

"The advantage is that the designs are dealt with in a new way which is the printing. As you know, if the presented garments were embellished heavily, I would say that I wouldn't be able to wear this at work, however, printing is a good idea, as it reduced the

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heaviness of the heritage needlework, at the same time, the idea was presented in a new

way". (Participant 4)

The previous quote showed the participant's appreciation and acceptance of the garments from this study with traditional embroidered motifs translated into the digitally designed and printed textile. Also, how printed embroidery was better than actual heavy stitching found in the traditional Thawb, which was the source of inspiration. Implied was acceptance to wear the traditional inspired garments in a new modern way.

An emphasis of the previous notion was expressed by one of the participants.

"Yes, I like that the garments had the contemporary look with the heritage spirit" (Participant 10)

The participants added that the contemporary style of the garments with the traditional inspiration maintained a stylish look with the spirit of the roots of the land, which implied the perceived acceptance by the participants of the possibility to wear garments from this study.

Thread and materials such as buttons and lead beads were used for embellishment of the presented garments. The minimal use of embroidery was implemented with the use of printed fabric as a way to simplify the general look of the presented garments. Participants were asked about their opinions regarding the combination of embroidery with digital textile print technology in the garments.

"For me, I appreciate the embroidery. I feel that it added variation especially in the

design of the grey background, and the embroidery in light colors, it was attractive. I

also appreciate adding buttons and ribbons. Although they were simple details I

appreciate all of them as the designs combined print, needlework, the ribbon and beads as complements". (Participant 2)

The previous quote showed the participant's appreciation for the contrast of the embroidery thread color with the background of the garments. She also expressed appreciation for the use of various materials for embellishing touches, which implied the perceived acceptance of wearing the presented garments. In contrast, one participant showed a different view regarding combining hand embroidery with printed fabric.

"Embroidery raises the cost, but has no important effect". (Participant 10)

The previous quote showed the participant's disagreement with adding any amount of embroidery in the presented garments as it would increase the cost and would not add aesthetic value in her opinion.

As the presented garments included both solid and printed fabrics, different levels of interest were expressed by the participants regarding the presence and distribution of the printed fabric.

"I liked the integration of more than one printed fabric because the garments were traditionally inspired". (Participant 9)

The previous quote showed how the participants appreciated the use of more than one digitally designed textile in most of the presented garments. This quote implied the participant's acceptance of the proposed garments as they were expressive with the traditional motifs. In addition, there was an opinion among most of the participants which implied the preference for the designed textile to be used for only the tops of the presented garments.

"Distribution of printed fabric for the tops are nice". (Participant 1)

"I would prefer all lower parts to be plain". (Participant 11)

The previous quotes implied the acceptance of the presented garments as they were mostly comprised of printed fabric on the tops with solid pants or skirts with the exception of some garments that included printed fabrics in the skirt or the pants. In contrast, some participants had a different opinions regarding the distribution of the designed textile in the garment.

"Many designs needed to be more simple". (Participant 3)

"I would like to see less use of multiple textiles of the printed fabric". (Participant 10)

The previous quotes showed that some participants preferred reducing the use of the designed textiles in the garment as to be more simple and acceptable for work.

Embroidery was implemented on the garments as touches on the printed fabric or as a border in one of the designs on the solid fabric. Varied opinions from the participants were obtained regarding the combination of printed fabric and hand embroidery.

"I feel that the embroidery is attractive, I suggest to reduce printing and increase embroidery in order to be more attractive". (Participant 11)

The previous quote showed that the participant preferred increasing embroidery in the garment as to look more stylish. This opinion implied the acceptance of the traditional look in the presented garments. Another opinion regarding the combination of printed fabric and hand embroidery was obtained by a participant.

"Embroidery is nice on the printing, but I would prefer the printing to be light". (P 6)

Previous quotes showed the participant preference for using lighter value colors for the printed fabrics in order to make the embroidery more visible.

Fabric Used in Garment Designs (Functional and Aesthetic)

Designed textiles and solid fabrics in the presented garments were printed on cotton as it was previously found that it would meet participants' needs for the work attire (Al-Amoudi, 1994; Bark, 1987; Turkustani, 1995). Participants were asked about any changes they would like to see on the presented garments in order to make them wearable at work in terms of the functional aspects of design.

> *"Work attire should be suitable to the weather. It is very hot here, and we appreciated the use of cotton or light materials."*(Participant 1)

The previous quote showed the participant's appreciation of using cotton fabric as a good choice for work attire. Although some participants agreed on the advantages of using cotton for the work attire, they had a different point of view regarding the ease of care of the garments made of cotton.

> *"I like to get up and take the dress from the closet and wear it, then go to work directly with no need to iron it".* (Participant 3)

The previous quote showed that the high maintenance care was the reason why some participants thought that cotton would not be the best material for work attire.

Color (Aesthetic)

Colors of the printed fabrics in the presented garments were softened and matched with solid colors in each garment, and they were mainly inspired from the colors of the traditional dress and the natural surroundings of Hejaz. Participants were asked about any changes they would like to see on the presented garments in order to make them wearable at work in terms of the aesthetic aspects of design.

"Colors are suitable for work". (Participant 7)

"The colors of the garments made me feel that the collection is harmonized. I like them". (Participant 2)

The previous quotes showed how the participant thought that colors of the presented garments made them acceptable to be worn at work. Similarly, the second quote showed the participant's point of view for the appreciation of the colors of the garments harmonizing in the collection. In contrast, a participant thought differently about the colors of the garments to be worn at work

"I would love to see white and beige colors in morning work attire". (Participant 6)

The previous quote showed the participant's preference for light colors regarding clothing for work attire as being worn during the day. This preference was related to light colors of the solid fabrics as background colors for the printed fabrics.

Discussion

The previous findings showed varying levels of appreciation regarding different aspects of the presented garments as looking traditional and at the same time were acceptable to wear in

the academic environment. Saudi females showed appreciation for a stylish contemporary look that would make them look modern (Tawfiq, 2012). Participants expressed appreciation about how wearing any of the presented garments would affect their inner comfort and feelings of cultural affiliation. Saudi females consider the use of dress to present different selves while they appreciate the positive inner feelings with particular dress that make them feel like their real self (Tawfiq, 2012).

The previous findings also showed participants' perceptions regarding FEA aspects of the presented garments. The preferences were interrelated between the three FEA aspects (Lamb and Kallal, 1992). Participants showed appreciation for the presented garments embellished with embroidery, which expressed a traditional appearance, and they also appreciated the simple and practical style of the garments. This need was emphasized previously in the literature for Saudi females' desire for simple and not heavy embellished attire for work (Turkustani, 1995).

The participants showed varying levels of appreciation regarding the traditional look in the motifs of the fabrics in the garments from this study alongside the contemporary look of interchangeable garment components. According to Bark and Turkustani, it is important to consider the two-piece garments for work attire (Bark 1987, Turkustani 1995). Moreover, participants differed regarding the garment style lines, fit and aesthetic appeal along with the style lines being suitable for different sizes.

<center>Interest in Versatile Work Attire (Functional)</center>

Following the appropriate dress codes regarding different settings in participants' social lives, most participants appreciated the flexibility the garments in this study would allow, in terms of dressing for different occasions including the professional setting.

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Modesty and Cultural Appropriateness (Cultural and Functional)

Some of the garments in this study were comprised of long tops with pants, and others were comprised of short tops with skirts following the dress code of the participants' professional setting. Participants showed appreciation for the multiple possible uses of the presented garments when they were asked about their willingness to wear any of the proposed garments.

"Not only as work attire, but I would also wear those garments when I go abroad for

Hijab". (Participant 12)

The previous quote showed the participant's appreciation of the silhouette and the style lines of the presented garments that made them look modest. Also that it would be possible to wear for work and then off-campus for Hijab as the garments would meet the Saudi religious dress code. In addition, regarding wearing the presented garments for the purpose of Hejab, participants were asked about any thoughts they would like to emphasize regarding the presented garments.

"I would prefer if all the tops were long down to the knee, so as to be more suitable to

the Hejab, it will be more acceptable". (Participant 6)

"The garments are modest and can be worn any place whether on campus or off campus,

not only as work attire". (Participant 8)

The first quote showed the participant's interest for all the garments being designed with long tops worn with pants. This implied the consideration for cultural appropriateness along with the desire for comfort. The second quote showed also the appreciation for consideration of

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modesty in the garments that would make them suitable for the professional setting as well as other social settings.

Versatile Uses of Work Attire (Functional)

The garments from this study were designed with the purpose of being worn for professional environment; colors of the designed textiles were softened, and the solid color fabrics were chosen to match the printed fabrics. Participants differed regarding color in terms of their suitableness for the workplace setting. Participants were asked if they would wear any of the presented garments and why.

> *"Colors are suitable to be worn here or off campus".* (Participant 7)

The previous quote showed the participant's appreciation for the color of the presented garments by mentioning that they were acceptable to be worn in the professional setting as well as to other social occasions. Some participants were used to wearing traditional but modernized Thawbs for special occasions, and they used Western style garments for other social occasions. Participants differed in willingness to wear the presented garments not only in special occasions, but also in other social occasions including the professional setting. Participants were asked if they would wear any of the presented garments and why.

> *"The garments could be worn as Hejab or when traveling in social and special occasions".* (Participant 9)

> *"I can wear these designs in Ramadan and visits for relatives and feasts…. Yes, I can wear them not only at work, but also in family meetings".* (Participant 10)

The previous quotes showed participants' appreciation for wearing the presented garments not only for work but also for other social occasions, as they looked traditional but contemporary simultaneously. Some of the presented garments had two versions, one with pants and another with skirts that allowed for different options that participants could choose for work attire. Participants appreciated this advantage of the mixing and matching potential of the presented garments.

"To be a set, I appreciated that, so I can mix and match as I prefer". (Participant 10)

The previous quote showed the participant's appreciation for the presented garments with two versions; she appreciated the ability for mixing and matching the separates. This implied participants' desire for various options in choosing work attire which could be worn for different social occasions.

Discussion

Participants showed different levels of appreciation for the garments in this study, with appreciation for modesty in the garments mentioned often. Saudi females are influenced by the Islamic faith that calls for modest clothing, when they present the desired look of self (Tawfiq, 2012). Saudi working women look for garments that are designed with the consideration of functional and aesthetic aspects of design along with the consideration of cultural values of modesty (Turkustani, 1995).

Participants showed appreciation regarding the multiple uses of the garments from this study, as they could be worn for the professional setting as well as for other social occasions, as designs provided an aesthetic that looked both traditional and contemporary. Saudi female has to

make different decisions regarding the nature of dress for different occasions and audiences (Tawfiq, 2012).

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

The purpose of this data-based research was to create a collection of professional dress ensembles for Saudi female academics using CAD technology for textile design and printing, pattern drafting, and apparel illustration. The textile and apparel designs were inspired by ethnic embroidery of the Hejaz (Western province of Saudi Arabia). This endeavor was implemented in order to know if Saudi female academic professionals in Jeddah would be interested in wearing professional attire that had ethnic-inspired style lines and ethnic-inspired textile designs, compared to their usual Western-inspired work attire.

The FEA consumer needs model (Lamb & Kallal, 1992) along with an adapted version of participatory design model (Demirbilek & Demirkan, 2004) were used as frameworks for the study in order to situate participants' FEA needs through the four phases of the participatory model. The participatory design model was adapted from the Usability, Safety, and Attractiveness Participatory Design model (USAP) in order to transform a concept into a design description, so that products (in this case garments) would be capable of producing the determined functions (Demirbilek & Demirkan, 2004).

In this study, the engagement of the participants was in the first phase (concept development) where the participants provided their feedback regarding preliminary sketches. Participants' engagement also occurred in the final phase (evaluation phase), where they evaluated the finished garments with regard to whether the garments met their needs, and if they would wear them.

The following research questions guided this research:

- Was it possible to combine traditional Hejazi embroidery patterns with digital printing technology?

- Would Saudi female academic professionals in Jeddah be interested in wearing professional attire that has ethnic-inspired, CAD printed fabric embellished with hand embroidery in comparison to their usual work attire?

Objectives guided by the aforementioned research questions were developed for this study specifically four objectives, which will guide the following discussion.

Objective 1: Producing and Evaluating Hejaz Collection Using the FEA Consumer Needs Model

Findings from the focus group suggested that there were overlaps between the main Functional, Aesthetic, and Expressive attributes of the FEA model (Lamb & Kallal, 1992). Many times the participants' responses were in the form of combined attributes such as Functional/Aesthetic, or Aesthetic/Expressive. The implication here is that the FEA model continues to be useful in its original configuration. It is broad enough to be applicable to a variety of consumer studies, and findings in this research do not indicate the need for change in the model structure.

While various studies have found that the functional aspect of comfort in clothing is most important in female consumer decisions regarding work attire (Green, 2001), other studies stress the importance of functional aspects of fabrics that are cool in hot climates (Al-Amoudi, 1994;

Bark, 1987), and the need for practical designs for work attire (Turkustani, 1995). In this study, the aesthetic dimension of the apparel designs seemed to prevail in the responses of participants.

The aesthetic attributes prioritized by the study participants in their responses included the colors and ethnic motifs used in the digitally designed and printed textiles, style lines of the garments, versatility of the various garments in each ensemble, and the silhouette of the designs. It is possible that the aesthetic/expressive dimensions predominated because the faculty in the study were engaged in teaching apparel and textile design. Further study would need to be conducted with faculty from multiple disciplines to ascertain whether differences in participant responses were based on their academic areas of expertise.

Although to some extent, aesthetic aspects of the garments in this study overlapped with the functional aspects, the overlap was more pronounced between the Aesthetic and Expressive aspects. Several participants mentioned they appreciated that the revival of the heritage of traditional dress was done in a way that also looked modern and suitable for the work environment. This overlap was evidenced in the scores given to the designs in this study, in that the aesthetic and the expressive aspects were often similar (Table 4.2, page 56).

Findings were consistent with the FEA model in that culture was part of every participant's response (Lamb & Kallal, 1992). Culture was implied as a lens through which all FEA aspects were experienced along with the participants' perception of dress. The participants mentioned directly or indirectly the importance of culture when discussing their appreciation for the garments in this study in terms of presenting ethnic identity, reviving heritage, or using the garments as a teaching tool. The core notion of importance within the expression of culture, was that culture was expressed on a daily basis. The participants were interested in an approach to

communicating culture in modern ways that made wearing traditional, ethnically-inspired designs acceptable in this timeframe and in the professional setting.

Statistical analysis of the data in this study suggests that the co-design process is an effective way to increase consumer satisfaction with a product. The overall FEA ratings for each prototype garment in the study were higher in the final evaluation (after the researcher modified both the textile and the garment designs), than ratings in the preliminary phase of the co-design process.

Objectives 2 and 3: Willingness to Wear and Pay More for Culturally Inspired Dress in the Time of Standardization of the Western Dress

Not only was it shown possible to use traditional Saudi embroidery stitches for motifs in digital textile designs, but that study participants perceived that the CAD technology was instrumental in the ethnic designs appearing modern and appropriate for the professional setting. Study participants stated that they would be proud to wear garments from this study as professors in an academic environment. And further, by wearing garments from this study, they felt that the design subjects they taught would be energized. They perceived that wearing these ethnically-inspired, contemporary garments would be consistent with their intent of being good role models for their students. Also, statistical analysis of the data in this study represented participants' willingness to pay more for culturally inspired form of professional work attire.

Objective 4: Valuing Hand Embroidery in This Era of Technology

Overall, the study participants responded positively to the opportunity to present traditional ethnic identity in a modernized acceptable way. This was implied in association with the interest in digital design technology as a way to reclaim cultural heritage. The participants

thought that the use of CAD technology would be a great means to represent culture in a contemporary way because traditional dress was produced manually. And even the modernized traditional dress that has been produced in industry, is heavily embellished with machine embroidery. And the heaviness of the machine embroidery made participants not wear those garments in a professional setting. The participants liked the ability to represent heritage while maintaining the simple look using CAD technology.

<div align="center">Contributions to the Field of Apparel and Textiles</div>

Generally, this research provides greater understanding of the ethnic culture of the western province in Saudi Arabia for Western scholars. In addition, the FEA consumer needs model combined with the participatory design model that underpinned this study could be useful in researching consumers' responses to various products that are infused with a cultural presence. These products could be accessories used or worn by Saudi female academics, or products that would be relevant to different consumers and/or cultures.

Previous research has indicated an interest in having garment manufacturing take place in Saudi Arabia (Turkustani, 1990). Findings from this research may help provide justification for the support of potential small business opportunities for Saudi women who are qualified to work in the apparel industry. This study showed that projecting a cultural identity through wearing clothing that included traditional Saudi aesthetic design elements was important to participants in this study. Participants commented that it was good to have embroideries transformed into textile print designs, which were lightly accented with hand embroidery compared to the heavy stitching in traditional Hejazi Thawbs or to machine embroidered manufactured Thawbs. Further, that using CAD technology was an effective way to modernize the traditional design aesthetics.

Limitations and Recommendations

This study focused on culturally inspired work attire for Saudi female academics, and could lead to further research. There were several limitations in this research that may impact the generalizability of the findings. The first limitation was the small sample size. All study participants were teaching within the clothing and textiles paradigm, and further, all participants were from one University. This study would be much better if replicated with more participants. In the University setting, recruiting faculty members from multiple concentrations within departments of clothing and textiles would increase the number of the participants, which would provide more variety and depth of collaboration. In addition, future research might involve faculty from multiple departments outside of clothing and textiles, to compare and contrast their responses to design work and/or interest in engaging as co-designers. Regular consumers also might be involved in future research as participants and co-designers to measure their openness to wear the garments in this study.

The second limitation was that the preliminary survey was conducted online compared to a face-to-face survey process. One recommendation from this study would be to structure future research in a way that would result in more engagement with the participants during all phases of the co-design process. It is the contention of this researcher that co-design projects must be done in close proximity, so that there can be face-to-face communication many times throughout the design process. This would also provide more authentic and experiential feedback about the designs in terms of the functional and aesthetic aspects. From the functional aspect, proximity with co-designers would allow for wear-testing of the garments, and from the aesthetic aspect, co-designers would see colors of designs or sketches on paper instead of virtual images on the computer screen, in which often there is color discrepancy.

Another limitation of the study was that the prototype garments (or the final eight designs) were made to fit the researcher's body size compared to an industry standard size. Thus, the prototype garments in this study likely would not fit many of the study participants. To replicate this study, functional aspects could be evaluated more effectively if the prototype garments were produced in a standard size, so that participants could try on the garments. This addition to the study would allow examining participant satisfaction regarding functional aspects including different characteristics of comfort. Various functional aspects related to comfort which could be examined might be: fabric texture, comfort in work performance such as sitting and walking, preference of style lines and number of garment components in each ensemble, length of tops and skirts, and garment closures.

Within the functional realm, consideration of environmentally sustainable fabrics would be valuable, as the participants showed interest in culturally inspired work attire. Although Western work attire basically does not follow trendy fashion styles, the notion of culturally inspired work attire could be discussed in terms of durability which would allow for keeping clothing longer, compared to replacing them for more trendy fashionable attire for work.

Finally, there is a need to conduct research to establish the relative durability of the digital images printed onto fabrics with regard to washing and wearing. Standard textile testing measures could be applied to assess image loss due to abrasion during the washing process, image loss due to crocking that might happen during wear, color loss due to exposure to sunlight and/or washing abrasion or wear crocking.

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APPENDIX I

FIRST ONLINE QUESTINNAIRE

FIRST ONLINE QUESTINNAIRE

Collaborative Apparel Design Research Study

Dear Participant,

I would like to invite you to take a survey on perceptions of proposed workplace apparel designs. This information will be used in a project as partial completion for a Master's of Science Thesis at Colorado State University. Participant codes will be assigned to each participant, and no names will be used during the study. Thus, results will be confidential

Please take a few minutes to respond to the questions as accurately as possible. The survey includes questions related to collaborator and demographic information, as well as your perceptions of 8 possible designs. If you are not certain of an exact answer, please estimate as closely as possible. If you feel uncomfortable answering any question, please skip that question.

Thank you for participating in this study. Your help is valuable as a tool for this and future work in the area of functional design. If you have any questions about the survey, please contact me at 9704029203 or the Institutional Review Board at

Sincerely,

Sahar Ejeimi, Graduate Student   Terry Yan, Professor

Co-Principal Investigator   Principal Investigator

- o   I agree to participate
- o   I do not agree to participate

Participant code# _____

Demographic questions

Age: ____

How many years have you worked in teaching clothing and textiles? _____

What clothing and textiles subjects do you teach? _____

Approximately how much do you spend for your work attire per outfit? _____

On the following two pages, please circle the most appropriate answers for Sketch 1

Collaborative Questions for Sketch 1

1. On a scale of 1-5 what is your opinion about the *colors* of the outfit?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:
_____

2. On a scale of 1-5 what is your opinion about the *style lines* in the outfit?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:
_____

3. On a scale of 1-5 what is your opinion about the *silhouette* of the outfit?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:
_____

4. On a scale of 1-5 do you think that the textile designs are pleasing?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

5. On a scale of 1-5 do you think this outfit *looks professional* for work?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

6. On a scale of 1-5 do you think that the fit of the outfit would be comfortable allowing ease of walking, sitting and for work performance?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

7. On a scale of 1-5 do you think that this outfit would be comfortable for multiple sizes?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

For any of the previous designs:

Do you consider tribal motifs to be beautiful in modern dress?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

Do you think it would be meaningful to wear professional attire that has tribal patterns of the local area printed on the fabric?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

Do you think that wearing professional attire that has tribal motifs would be a positive form of non-verbal communication and/or acceptance?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

Do you think that tribal motifs are acceptable in professional dress?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

If using cotton and linen to make the proposed eight designs, do you think that this outfit would be durable and easy to care for (wash and iron)?

1	**2**	**3**	**4**	**5**
I strongly disagree	I do not agree	Neutral	I agree	I strongly agree

Comments:

_____

APPENDIX II

ARABIC FIRST ONLINE QUESTIONNAIRE

ARABIC FIRST ONLINE QUESTIONNAIRE

<div dir="rtl">

دراسة تعاونية بحثية في تصميم و تصنيع الملابس

عزيزتي المشاركة:

أرجو التكرم والمشاركة في الإجابة عن أسئلة الاستبيان الخاص بدراسة تصاميم الملابس المقترحة لأماكن العمل بأقسام الملابس والنسيج. حيث أن هذه المعلومات تعد جزء من رسالة بحثية علمية لنيل درجة الماجستير من جامعة ولاية كولورادو. سوف يتم ترميز بيانات المشاركات في هذه الدراسة دون ذكر للأسماء, وعليه فإن نتائج الدراسة ستكون سرية.

يتضمن الاستبيان أسئلة مرتبطة بمعلومات ديموغرافية وفنية (تصوراتك و آرائك لثمانية تصاميم مقترحة). في حال عدم معرفة إجابة محددة, أرجو اختيار الإجابة الأقرب قدر الإمكان. وفي حال عدم الرغبة في الإجابة عن سؤال يمكن تخطي ذلك السؤال.

شكرا لمشاركتك في هذا الاستبيان. تعاونك يعد أداة قيمة في هذه الدراسة ولدراسات مستقبلية في مجال التصميم الوظيفي. إذا كان لديك أي استفسار بخصوص هذا الاستبيان, أرجو عدم التردد في التواصل معي عبر الهاتف رقم 19704029203+

مع خالص التقدير,

كينيث تريمبلي, أستاذ	سحر عجيمي, طالبة دراسات عليا
الباحث الرئيسي	الباحث المشارك

o   أوافق على المشاركة

o   لا أوافق على المشاركة

</div>

الأسئلة الديموغرافية

العمر: _____

كم عدد سنوات تدريسك لمواد الملابس والنسيج؟_____

ما هي المواد الدراسية التي تقومين بتدريسها في تخصص _____
الملابس والنسيج؟

بالتقريب, كم تنفقين في شراء ملابس العمل سنويا؟_____

في الصفحتين التالية, يرجى وضع دائرة حول الإجابة الأنسب للتصميم رقم 1

ما رأيك بألوان الزي؟

5	4	3	2	1
ممتاز	جيد	مرضي	محايد	غير مرضي

ملاحظات : --...

ما رأيك بخطوط تصميم الزي؟

5	4	3	2	1
ممتاز	جيد	مرضي	محايد	غير مرضي

ملاحظات :--...

ما رأيك بالشكل العام للزي؟

5	4	3	2	1
ممتاز	جيد	مرضي	محايد	غير مرضي

ملاحظات : --...

هل تعتقدي بأن تصميمات النسيج جذابة؟

5	4	3	2	1
أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة

ملاحظات :--...

هل تعتقدي بأن هذا الزي ملائم للعمل؟

5	4	3	2	1

لا أوافق بشدة   لا أوافق   محايد   أوافق   أوافق بشد

ملاحظات : -...

هل تعتقدين بأن هيئة الزي مريحة, بحيث تسمح بالراحة في المشي والجلوس وأداء العمل؟

5	4	3	2	1

لا أوافق بشدة   لا أوافق   محايد   أوافق   أوافق بشدة

ملاحظات : -...

هل تعتقدين بأن هذا الزي سيكون مريحا بعدة مقاسات مختلفة؟

5	4	3	2	1

لا أوافق بشدة   لا أوافق   محايد   أوافق   أوافق بشدة

ملاحظات : -...

لأي من التصاميم السابقة:

هل تعتبرين الوحدات التراثية المطبوعة على النسيج أنيقة في التصميم العصري؟

5	4	3	2	1

لا أوافق بشدة   لا أوافق   محايد   أوافق   أوافق بشدة

ملاحظات : -...

هل تعتقدين بأن إضافة وحدات تراثية محلية (مطبوعة على النسيج) لزي العمل الرسمي أمر مجدي أو ذو دلالة؟

5	4	3	2	1

لا أوافق بشدة   لا أوافق   محايد   أوافق   أوافق بشدة

ملاحظات :-...

هل تعتقدين أن ارتداء الزي الرسمي للعمل والمزين بوحدات تراثية أمرا إيجابيا كصورة من التواصل غير اللفظي و/أو القبول؟

5	4	3	2	1

لا أوافق بشدة   لا أوافق   محايد   أوافق   أوافق بشدة

ملاحظات : -...

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هل تعتقدين بأن الوحدات التراثية مقبولة في الزي الرسمي للعمل؟

5	4	3	2	1
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة

ملاحظات :-...

باستخدام خامتي القطن والكتان لتنفيذ التصاميم، هل تعتقدين أن هذه الأزياء ستكون سهلة في العناية (غسل وكي)؟

5	4	3	2	1
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة

ملاحظات :-...

APPENDIX III

EVALUATION QUESTIONNAIRE

EVALUATION QUESTONNAIRE

Dear Participant,

This final questionnaire is designed to evaluate workplace apparel designs regarding your preferences of the workplace attire through the collaborative design process. This information will be used in a project as partial completion for a Master's of Science Thesis. Participant codes will be assigned to each participant, and no names will be used during the study.

Please take a few minutes to respond to the questions as accurately as possible. If you are certain of an exact answer, please estimate as closely as possible. If you feel uncomfortable answering any question, please skip that question.

The completion of this survey concludes the research process. On behalf of the entire research team, we would like to sincerely thank you for participating in this study. Your help has been a valuable as a tool for this and future work in the area of functional design.

Sincerely,

Sahar Ejeimi, Graduate Student   Terry Yan, Associate Professor

Co-Principal Investigator   Principal Investigator

Participant Code #_____

Demographic questions

Age: ____

How many years have you worked in teaching clothing and textiles?   _____

What clothing and textiles subjects do you teach? _____

Approximately how much do you spend for your work attire per outfit? _____

Please evaluate how much you think that the design above meets your preferences for workplace attire:

1. On a scale of 1-5 do you think that the color in the outfit meets your aesthetic preferences?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

2. On a scale of 1-5 do you think that the silhouette and style line of the outfit meets your aesthetic preferences?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

3. On a scale of 1-5 do you think that the textile design are pleasing and meet your aesthetic preferences?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

4. On a scale of 1-5 do you think this outfit meets your preferences of looking professional for work?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

5. On a scale of 1-5 do you think that the fit of the outfit is comfortable allowing ease of walking, sitting and for work performance?

1	**2**	**3**	**4**	**5**
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

6. On a scale of 1-5 do you think that this outfit is comfortable for multiple sizes?

1	2	3	4	5
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

7. On a scale of 1-5 do you think that wearing this outfit that has tribal motifs is a positive form of non-verbal communication and/or acceptance?

1	2	3	4	5
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

8. On a scale of 1-5 do you think that tribal motifs are acceptable in professional dress?

1	2	3	4	5
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

9. Do you think that the texture of the garment is practical in terms of ease of care (washing and ironing)?

1	2	3	4	5
Not satisfying	Neutral	Satisfying	Good	Excellent

Comments:

_____

10. How much would you pay for this culturally inspired garment?

Thank you for your time!

APPENDIX IV

ARABIC EVALUATION QUESTIONNAIRE

ARABIC EVALUATION QUESTIONNAIRE

دراسة تعاونية بحثية في تصنيع الملابس

عزيزتي المشاركة,

هذا الاستبيان النهائي والمصمم لتقييم أزياء العمل بناء على تفضيلات المصممات المشاركات للزي الرسمي للعمل من خلال عملية التصميم التعاوني. هذه المعلومات تعد جزء من رسالة بحثية علمية لنيل درجة الماجستير من جامعة ولاية كولورادو. سوف يتم ترميز بيانات المشاركات في هذه الدراسة دون ذكر للأسماء, وعليه فإن نتائج الدراسة ستكون سرية.

يرجى الإجابة عن أسئلة الاستبيان. في حال عدم معرفة إجابة محددة, أرجو اختيار الإجابة الأقرب قدر الإمكان. وفي حال عدم الرغبة في الإجابة عن سؤال يمكن تخطي ذلك السؤال.

باكتمال هذا الاستبيان , يصل فريق البحث إلى نهاية هذه الدراسة البحثية. نيابة عن فريق البحث, أتقدم بخالص الشكر والتقدير لمشاركتك في هذه الدراسة. تعاونك يعد أداة قيمة في هذه الدراسة ولدراسات مستقبلية في مجال التصميم الوظيفي. إذا كان لديك أي استفسار بخصوص هذا الاستبيان, أرجو عدم التردد في التواصل معي عبر الهاتف رقم 9704029203

مع خالص التقدير,

يان تيري،أستاذ	سحر عجيمي, طالبة دراسات عليا
الباحث الرئيسي	الباحث المشارك

o   أوافق على المشاركة

o   لا أوافق على المشاركة

رمز المشاركة #‏ ---------

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الأسئلة الديموغرافية

العمر : _____

كم عدد سنوات تدريسك لمواد الملابس والنسيج؟_____

ما هي المواد الدراسية التي تقومين بتدريسها في تخصص _____

الملابس والنسيج؟

بالتقريب, كم تنفقين في شراء ملابس العمل؟_____

التصميم 1

آرجو اختيار الإجابة المناسبة التي تمثل درجة تقييمك للتصميم بناء على تفضيلك لزي العمل

1. ما مدى جمال ألوان الزي؟

5	4	3	2	1
غير مرضي	محايد	مرضي	جيد	ممتاز

ملاحظات : --...

2. ما مدى جمال الشكل العام و خطوط تصميم الزي؟

5	4	3	2	1
غير مرضي	محايد	مرضي	جيد	ممتاز

ملاحظات : --...

3. ما مدى جمال تصميم النسيج في الزي؟

5	4	3	2	1
غير مرضي	محايد	مرضي	جيد	ممتاز

ملاحظات : --...

4. هل تعتقدين بأن هذا الزي له مظهر رسمي كزي عمل؟

5	4	3	2	1
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة

ملاحظات : -...

5. هل تعتقدين أن هيئة التصميم مريحة للحركة , الجلوس, وأداء العمل؟

	5	4	3	2	1

أوافق بشدة أوافق محايد لا أوافق لا أوافق بشدة

ملاحظات : -...

هل تعتقدين أن هذا الزي مناسبا بأكثر من مقاس؟

	5	4	3	2	1

أوافق بشدة أوافق محايد لا أوافق لا أوافق بشدة

ملاحظات : -...

6. هل تعتقدين أن ارتداء هذا الزي ذو الوحدات التراثية أمرا ايجابيا كصورة للتواصل غير اللفظي و/أو القبول؟

	5	4	3	2	1

أوافق بشدة أوافق محايد لا أوافق لا أوافق بشدة

ملاحظات : -...

7. هل تعتقدين أن الوحدات التراثية مقبولة في الزي الرسمي للعمل؟

	5	4	3	2	1

أوافق بشدة أوافق محايد لا أوافق لا أوافق بشدة

ملاحظات : -...

8. هل تعتقدين أن هذا الزي عمليا وسهل العناية به (غسل وكي)؟

	5	4	3	2	1

أوافق بشدة أوافق محايد لا أوافق لا أوافق بشدة

ملاحظات : -...

10. كم المبلغ المقدر لهذا الزي برأيك؟

شكرا جزيلا لمساعدتك

APPENDIX V

FOCUS GROUP QUESIONS

FOCUS GROUP QUESTIONS

1. Describe your favorite attire for work.

2. What do you think about the garments in general?

3. Would you wear any of these garments for work? Why?

4. What changes would you make to enhance the a) <u>functional</u> aspect of these garments?

5. What changes would you make to enhance the b) <u>expressive</u> aspect of these garments? (e.g., communicative, being accepted by others)

6. What changes would you make to enhance the c) <u>aesthetic</u> aspect of these garments? (e.g., colors, style line)

7. To what degree do you feel it is meaningful to wear any of these outfits that has tribal patterns of the local area printed on the fabric? Why?

8. The garments utilized different amounts of printed tribal Hejazi design. What amount do you think that the workplace attire should have in order to look stylish? Why?

9. What do you think about the hand embroidery combined with technology of digital printed textiles in the outfits? Do you think it enhances the value of the garments?

10. How do you feel when you wear clothing that has tribal Hejazi elements for special occasions? In what way you think you would feel and see yourself wearing any of these garments at work?

11. Are there additional comments/thoughts you would like to share with us?

APPENDIX VI

ARABIC FOCUS GROUP QUESTIONS

ARABIC FOCUS GROUP QUESTIONS

١. صفي ملبسك المفضل للعمل.

٢. مارأيك في ملابس العمل التي تم عرضه بشكل عام؟

٣. هل من الممكن آن ترتدي أي من الملابس التي تم عرضها؟ لماذا؟

٤. ما التغييرات التي قد تقومين بإجرائها لتطوير الجانب الوظيفي للملابس التي تم عرضها؟

٥. ما التغييرات التي قد تقومين بإجرائها لتطوير الجانب التعبيري للملابس التي تم عرضها؟

٦. ما التغييرات التي قد تقومين بإجرائها لتطوير الجانب الجمالي للملابس التي تم عرضها؟

٧. لأي درجة تعتقدين أنه أمر ذو معنى أو دلالة بارتداء أي من الملابس ذات التصاميم التراثية التي تم عرضها؟ لماذا؟

٨. الملابس التي تم عرضها احتوت نسب مختلفة من النسيج المطبوع بالزخارف التراثية. ماهي النسبة التي تعتقدين أن ملابس العمل يجب أن تحتويها لتبدوأنيقة؟ لماذا؟

٩. مارأيك في التطريز اليدوي ودمجه بتقنية طباعة النسيج في الملابس؟ هل تعتقدين أنه يزيد من قيمة الملبس؟

١٠. بماذا تشعرين عند ارتداء الملابس التي تحتوي على تصاميم تراثية في المناسبات الخاصة؟ كيف ستشعرين بنفسك عندما ترتدين أي من الملابس التي تم عرضها في العمل؟

١١. هل هناك أي تعليقات أو أفكار تودين مشاركتها؟

APPENDIX VII

CONSENT FORM

Consent to Participate in a Research Study

Colorado State University

TITLE OF STUDY: Hejazi Tribal Inspired and CAD Produced: A Collaborative Design Process Engaging Saudi Female Academics

PRINCIPAL INVESTIGATOR: Ruoh-Nan Yan, 161 Aylesworth SE, Colorado State University, Fort Collins, CO 80523-1574. Phone: 970.491.5331. Email**:** RuohNan.Yan@ColoState.Edu.

CO-PRINCIPAL INVESTIGATOR: Sahar Ejeimi, Colorado State University, Fort Collins CO 80523-1574. Phone: 970.402.9203 Email: S.Ejeimi@Gmail.com.

WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH? As a faculty member at King Abdul-Aziz University (KAU), the Department of Clothing and Textiles, you are invited to participate in the research project. Information obtained from the survey and the focus group discussion will help support the collaborative design process for a product line of professional attire for Saudi female academics in Hejaz. The design line will combine traditional Hejazi tribal embroidery techniques with state-of-the-art digital textile printing, illustration, and pattern drafting technology.

WHO IS DOING THE STUDY? We are researchers at Colorado State University in the United States.

WHAT IS THE PURPOSE OF THIS STUDY? The purpose of this databased research is to create a collection of professional dress ensembles for Saudi female academics based on their preferences. The textile and apparel designs will be inspired by ethnic embroidery of the western (Hejaz) province of Saudi Arabia. Two models will be used in the research. The Functional Expressive Aesthetic Consumer Needs Model will be used to situate and define the Saudi female academic population. And a participatory design model will be used to inform a collaboration in which a small group of Saudi female academics will be engaged in the design process as participants.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?
Focus group discussions will take place at a location convenient to you and will last between 45-90 minutes. Focus groups will take place in the year of 2015.

WHAT WILL I BE ASKED TO DO? If you decide to continue participating in this research, you will first complete a questionnaire given to you by the researcher. Then you will join a focus group discussion moderated by the researcher. During the focus group discussion, you will be asked to answer questions related to your evaluation of the designed garments for the workplace. With your permission, we will audiotape and transcribe the interview.

ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY? You should participate in this study only if you are a KAU faculty member and you teach in the Department of Clothing and Textiles.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS? There are no known risks associated with participating in this study. It is not possible to identify all potential risks in research procedures, but the researcher has taken reasonable safeguards to minimize any known and potential, but unknown, risks.

WILL I BENEFIT FROM TAKING PART IN THIS STUDY? There is no direct benefit that the researchers can positively say will affect all participants, but we hope that participants will gain better awareness of their apparel consumption and preferences for combining ethinic (worn in some special occasions) and workplace attire.

DO I HAVE TO TAKE PART IN THE STUDY? Your participation in this research is voluntary. If you decide to participate in the research, you may withdraw your consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.

WHAT WILL IT COST ME TO PARTICIPATE? There are no costs associated with participation in this study.

WHO WILL SEE THE INFORMATION THAT I GIVE? We will keep private all research records that identify you, to the extent allowed by law.

Your information will be combined with information from other people taking part in the research. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be identified in these written materials. We may publish the results of this study; however, we will keep you name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. Additionally, we will assign a numeric code (e.g., "Participant 1") to the audiotape and transcript of the focus group discussion. Your name will be kept separate from your research records (e.g., the discussion audiotape and transcript) and these things will be stored in different places under lock and key.

CAN MY TAKING PART IN THE STUDY END EARLY? Your participation is voluntary. You may withdraw your consent and stop participating at any time during the interview without penalty. You may be removed from the study if you do not engage fully in the discussion or if discussion questions are not applicable.

WILL I RECEIVE ANY COMPENSATION FOR TAKING PART IN THIS STUDY? Yes. You will receive compensation in the form of refreshments during the focus group discussion.

WHAT HAPPENS IF I AM INJURED BECAUSE OF THE RESEARCH? The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

WHAT IF I HAVE QUESTIONS? Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the investigator, Dr. Ruoh-Nan Yan at 970.491.5331. If you have any questions about your rights as a volunteer in this research, please contact Research Integrity & Compliance Review Office (RICRO) at 970.491.1553. I will give you a copy of this consent form to take with you.

WHAT ELSE DO I NEED TO KNOW? The researchers would like to audiotape your participation in the focus group discussion to be sure that your comments can be transcribed accurately. The tape and relevant transcription file will be destroyed in 2018. Do you give your permission for us to audiotape the discussion?

YES ☐   *NO* ☐   I give the researchers permission to audio tape my participation in the focus group discussion.

This consent form was approved by the CSU Institutional Review Board for the protection of human subjects in research.

Your signature acknowledges that you have read the information stated and willingly sign this consent form. Your signature also acknowledges that you have received, on the date signed, a copy of this document containing 2 pages.

_____   _____

Signature of person agreeing to take part in the study   Date

_____

Printed name of person agreeing to take part in the study

_____   _____

Name of person providing information to participant   Date

_____

Signature of Research Staff

Page __ of __ Participant's initials _____ Date _____

APPENDIX VIII

ARABIC CONSENT

موافقة بالمشاركة في دراسة بحثية

جامعة ولاية كولورادو

عنوان الدراسة: منتج تراث حجازي: دراسة بحثية في تنفيذ خط تصميم تعاوني لأزياء عمل للأكاديميات بأقسام الملابس والنسيج

الباحث الرئيسي : روه- نان يان، Aylesworth SE161 ، جامعة ولاية كولورادو، فورت كولينز، .CO 80523-1574
هاتف: 970.491.5331. البريد الإلكتروني RuohNan.Yan@ColoState.Edu

الباحث المشارك: سحر عجيمي، جامعة ولاية كولورادو، فورت كولينز .CO 80523-1574 هاتف: 970.402.9203
البريد الإلكتروني.S.Ejeimi@Gmail.com

لماذا تمت دعوتي للمشاركة في هذا البحث؟ كعضو هيئة التدريس في جامعة الملك عبد العزيز, قسم الملابس والنسيج، فأنت مدعوة للمشاركة في مشروع البحث. المعلومات التي سيتم الحصول عليها من الاستبيان ومناقشة المجموعة سوف تساعد في دعم عملية التصميم التعاونية لخط المنتج لملابس العمل للأكاديميات. والذي سوف يجمع بين تقنيات التطريز المطبوعة على النسيج باستخدام برامج التصميم الحاسوبية المساعدة والبرامج المساعدة في رسم وتصميم النماذج.

من الذي يقوم الدراسة؟ باحثين في جامعة ولاية كولورادو في الولايات المتحدة.

ما هو الغرض من هذه الدراسة؟ الغرض من هذا البحث هو انتاج مجموعة تصاميم لملابس العمل للأكاديميات السعوديات والتي تتناسب مع ميولهم. الأقمشة المستخدمة في التصاميم وخطوط التصميمي سوف تكون مقتبسة من الملابس التقليدية القبلية في منطقة الحجازبالمملكة العربية السعودية. يتم استخدام نموذجين في البحث.النموذج الأول هو الاحتياجات الوظيفية التعبيرية الجمالية للمستهلك والذي يحدد الإطار الحضاري للأكاديميات.أيضًا سيتم استخدام نموذج التصميم التشاركي فيما يتعلق بعملية التصميم التعاوني التي سوف تشارك فيه مجموعة من الأكاديميات .

أين سيكون مكان الدراسة والى متى سوف يستمر؟ سوف يكون مكان مناقشة المجموعة في الموقع المناسب للمجموعة، وسوف تستمر بين 45-90 دقيقة. سوف يتم مناقشة المجموعة في عام 2015.

ما الذي سوف يُطلَب مني القيام به ؟ إذا قررت مواصلة المشاركة في هذا البحث، سوف تقومين أولا بإكمال استبيان يقدم لك من قبل الباحثة. ثم سوف تنضمين إلى مناقشة المجموعة والتي تديرها الباحثة. خلال مناقشة المجموعة ، سوف يُطلب منك المشاركة في الإجابة عن الأسئلة المتعلقة بالتقييم الخاص بك والمتعلق بالملابس المصممة لمكان العمل. بعد موافقتك، فإنه سوف يتم تسجيل صوتي لتدوين المناقشة.

هل هناك أسباب تجعلني غير مؤهلة للمشاركة في هذه الدراسة؟ يجب أن تشارك في هذه الدراسة فقط عضوة هيئة التدريس بجامعة الملك عبدالعزيز والتي تقوم بالتدريس في قسم الملابس والنسيج.

ما هي المخاطر المحتملة والمضايقات؟ لا توجد مخاطر مرتبطة بالمشاركة في هذه الدراسة. وليس من الممكن تحديد جميع المخاطر المحتملة في إجراء هذا البحث، ولكن الباحثة قد اتخذت ضمانات معقولة للحد من أي مخاطر محتملة.

هل سوف أستفيد من المشاركة في هذه الدراسة؟ ليس هناك فائدة مباشرة بحيث أن الباحثين يستطيعوا القول بأن هناك تأثير إيجابي سوف يؤثر على جميع المشاركات، ولكن نأمل أن المشاركات سوف تشارك في وعي أفضل فيما يتعلق باستهلاك الملابس واستكشاف احتماليات جديدة في الجمع بين الملابس التراثية وملابس العمل.

هل يجب أن أشارك في الدراسة؟ مشاركتك في هذا البحث تطوعي. إذا قررت المشاركة في البحث، ثم قررت سحب موافقتك والتوقف عن المشاركة في أي وقت يمكنك ذلك دون عقوبة أو فقدان المزايا التي تحق لك.

ماذا سيكلفني للمشاركة؟ لا توجد تكاليف مرتبطة بالمشاركة في هذه الدراسة.

من الذي سيرى المعلومات التي سأقدمها؟ سوف يتم تسجيل البيانات بشكل خاص والتي تعرف عنك بما يقتضيه قانون البحث.

صفحة _____ من _____ بالاحرف الاولى للمشاركة _____ تاريخ _____

سيتم دمج المعلومات التي تقدميها مع المعلومات المقدمة من المشاركات الأخريات في البحث. عندما نكتب عن الدراسة لتقاسمها مع باحثين آخرين، عندما نكتب عن المعلومات المقدمة من المجموعة ومشاركة ذلك مع الباحثين سيكون من المعلومات المدمجة التي جمعناها. لن يتم التعريف بك شخصيا في هذه المواد المكتوبة. قد يتم نشر نتائج هذه الدراسة؛ ومع ذلك، فإننا لن نذكر اسمك ومعلوماتك الشخصية.

وسوف نبذل كل جهد ممكن لمنع أي شخص ليس في فريق البحث من معرفة ما قدمتيه لنا من المعلومات، أو ماهية هذه المعلومات. بالإضافة إلى ذلك، فإننا سوف نقوم بتعيين رمز رقمي (على سبيل المثال، "مشارك 1") في التسجيل الصوتي ونسخة مناقشة المجموعة. سيتم الاحتفاظ باسمك منفصل عن سجلات البحث الخاصة بك (على سبيل المثال، التسجيل الصوتي ,المناقشة والنص) وسيتم تخزين هذه الأشياء في أماكن مختلفة بضمان القفل والمفتاح.

هل من الممكن أن تنتهي مشاركتي في البحث في وقت مبكر؟ مشاركتك تطوعية. يمكنك سحب موافقتك والتوقف عن المشاركة في أي وقت خلال المقابلة دون عقوبة. يمكن سحبك من الدراسة في حال عدم مشاركتك بشكل كامل في المناقشة أو إذا أو إذا كانت أسئلة النقاش غير قابلة للتطبيق.

هل هناك أي مقابل للمشاركة في هذه الدراسة؟ نعم. سوف يتم تقديم تعويض بالمشاركة في شكل المرطبات أثناء مناقشة المجموعة.

ماذا لو كان لدي أسئلة؟ قبل أن تقرري قبول هذه الدعوة للمشاركة في الدراسة، أرجو السؤال عن أي شيء يتبادر إلى ذهنك الآن. وفي وقت لاحق، إذا كان لديك أي أسئلة حول الدراسة، يمكنك الاتصال بالباحث الرئيس الدكتور روه نان يان على الرقم 970.491.5331. إذا كان لديك أي أسئلة عن حقوقك كمتطوعة في هذا البحث، يرجى الاتصال ببحوث النزاهة ومكتب مراجعة الامتثال (RICRO) على الرقم 970.491.1553. وسوف أعطيك نسخة من نموذج الموافقة هذا.

ماذا أيضا أحتاج أن أعرف؟ يرغب الباحثين في التسجيل الصوتي لمشاركتك في مناقشة المجموعة للتأكد من أن تعليقات المجموعة قد تم تسجيلها بدقة. سيتم التخلص من التسجيل وملف النسخ ذو الصلة في عام 2018. هل تعطي إذنك لنا بالتسجيل الصوتي للمناقشة؟

نعم   o لا   o أقدم إذني للباحثين بالتسجيل الصوتي لمشاركتي في مناقشة المجموعة.

تمت الموافقة على هذا النموذج من CSU مجلس المراجعة المؤسساتي لحماية البشر الخاضعين للبحوث.

توقيعك يقر أنك قد قرأت المعلومات الواردة والتوقيع بإرادتك على الموافقة في هذا النموذج. يقر توقيعك أيضا على أنك استلمت , في نفس تاريخ التوقيع, نسخة من هذا النموذج والذي يحتوي على صفحتين.

_____ _____

توقيع الشخص الموافق على المشاركة في الدراسة   التاريخ

_____

اسم الشخص الموافق على المشاركة في الدراسة

_____   _____

التاريخ   اسم الشخص الذي يقدم المعلومات للمشاركة

_____

توقيع فريق البحث

صفحة ____ من ____ الاحرف الاولى للمشاركة _____ التاريخ ____

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