

THESIS

FEMALE MUSLIM CONSUMER PURCHASE PREFERENCES FOR DIGITALLY PRINTED  
PORTABLE PRAYER RUGS

Submitted by

Maram M. Altilmisani

Department of Design and Merchandising

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Master's Committee:

Advisor: Diane Sparks

Ruoh-Nan Yan  
James Lindsay

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## ABSTRACT

### FEMALE MUSLIM CONSUMER PURCHASE PREFERENCES FOR DIGITALLY PRINTED PORTABLE PRAYER RUGS

The purpose of this study was to investigate female Muslim consumer preferences related to digitally-printed portable prayer rugs in the context of the FEA (Functional, Expressive, and Aesthetic) consumer needs model. For this study, the researcher designed and produced a series of eight digitally printed portable prayer rugs using motifs influenced by Islamic ornamental art to use as examples in this study. The FEA consumer needs model by Lamb and Kallal (1992) was incorporated as framework for the study in order to evaluate the digitally-printed portable prayer rugs. Fifty participants of female Muslim consumers participated in this study.

A quantitative method was implemented in this study in terms of data collection process to measure the level of interest among Muslim women in purchasing digitally printed portable prayer rugs for their functional, expressive, and aesthetic values. Simultaneously, the potential for marketing digitally printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women and its influence on the purchase decisions of socially concerned Muslim consumers was examined.

Findings from this study indicated that female Muslim consumers were interested in purchasing the digitally-printed portable prayer rugs. Results revealed that the functional value of the digitally-printed portable prayer rug was the most influential factor affecting the purchase intention of female Muslim consumers. Finally, the strategy of marketing digitally-printed

portable prayer rugs as a socially responsible product (fair trade product) positively influenced purchase intentions of female Muslim consumers toward those rugs.

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## DEFINITION OF TERMS

*Allah*: “The name of God in Islam, derived from the Arabic word al-ilah, meaning the One True God” (O’Neal, 2007, p. 293).

*Arabesque*: Can refer to one of two motifs. The first meaning of Arabesque is “The basic unit of the Arabesque, a favorite Islamic decorative theme; may be described as split leaf seen in profile” (Train, 1997, p. 64). Or: “An eight-lobed (medallion) formed by interlaced tendrils” (Bamborough, 1989, p. 42).

*Du‘at*: Supplications or petitions. Types of prayer distinct from the required ritual prayer (*salat*).

FEA Consumer Needs Model: “The crux of [the FEA (Functional, Expressive, and Aesthetic) framework] is a model of consumer needs that aids in developing design criteria for a variety of customers” (Lamb & Kallal, 1992, p. 42).

*Hajj*: “The compulsory pilgrimage to Mecca, once in a Muslim’s lifetime, as long as he/she is financially and physically able to do it” (Sandikci & Rice, 2011, p. *xix*).

*Kabah*: “After the coming of Islam, the *Kabah*, which is a simple cube-shaped building now covered with black and gold cloth, would be regarded by Muslims as God’s first house on earth, built by Adam and later rebuilt by the prophet Abraham and his son Ismail” (Ahmed, 1999, p. 14).

*Ka’bah*: “The cubical stone building at the heart of the Great Mosque in Makkah” (Douglas, 2002, p. 104).

*Ka’aba*: “The shrine built by the prophet Abraham in the holy city of Mecca and the focal point of pilgrimages to the city” (O’Neal, 2007, p. 293).

*Mecca*: “A city in present-day Saudi Arabia, the holiest site of Islam, where the religion will be founded” (O’Neal, 2007, p. 293).

*Mihrab*: “A linear representation of a prayer niche, which appears in a number of forms on prayer rugs. The mihrab is present in all Mosques and indicates the direction of Mecca, which all faithful face when they pray” (Bamborough, 1989, p. 44).

*Muslims*: Followers of Islam (O'Neal, 2007).

*Qibla*: The direction of prayer, in Islam, facing Mecca (Esposito, 1995; Gillow, 2010; Khan, 2005; Sandikci & Rice, 2011).

*Salat*: “Daily prayer” (O'Neal, 2007, p. 293). Also: “an obligation to perform ritual prayers five times every day in the proper way” (Temporal, 2011, p. 4).

*Obligatory ritual prayer*: One of the five pillars of Islam that is performed at five prescribed times each day.

*Umra*: “The lesser pilgrimage, which can be made to Mecca during any time of the year” (Sandikci & Rice, 2011, p. xxi).

*Zakat*: “Regular (usually annual) welfare contribution to the poor in society” (Temporal, 2011, p. 4).

## CHAPTER 1- INTRODUCTION

In contemporary society, the world population of Muslims is growing. There are an estimated 1.65 to 1.8 billion Muslims living in various parts of the world (“Pew Research Religion and Public Life Project,” 2012). Because the Muslim population is increasing, marketers can benefit from creating products that can be targeted specifically toward Muslims. According to Alserhan & Alserhan (2012), “[The] Muslim consumer group is not limited to one country, but instead exists in economically feasible numbers in the majority of the countries in the world” (p. 131). A number of Western companies, including Apple, McDonalds, Gap, Coach, and many others, have noted this market potential and have stores and market products in countries that are predominantly Muslim, such as Saudi Arabia and other countries in the Arabian Gulf.

The Muslim consumer market represents a significant growth opportunity for firms around the world. According to Paul Temporal (2010), an associate fellow at the Said Business School at the University of Oxford, “The next big market is the Muslim market. There’s this huge group of people who have been relatively untapped in terms of what they want and need, and they represent a tremendous opportunity” (p. 1). Although the Western companies noted above market their products in some countries that are predominantly Muslim, most do not create new, or alter existing, products to appeal to Islamic practices or the Muslim identity. Sandikci (2011) suggests that marketers in this sector should focus on the daily practices of Muslim consumers for which products may be relevant. Knowledge of Islam is essential to develop successful products for Muslim consumers.

Islam is the second largest and most rapidly growing religion in the world, and Muslim people, as followers of Islamic faith, are accustomed to practicing Islamic customs every day of their lives (Ahmed, 1999). The five fundamental pillars of Islam are: 1) the *Shahadah*, which is a declaration of faith to God; 2) *Salat*, which is a daily prayer; 3) *Zakat*, which is annual charitable giving to the needy in Muslim society; 4) *Sawm*, which is fasting; and 5) *Hajj*, which is a pilgrimage (Ahmed 1999; Esposito, 1999; O'Neal, 2007). Daily prayer is a core Islamic practice, and all Muslims who have reached puberty are required to pray five times a day. This thesis will focus on this custom due to its religious significance and the marketing opportunities it presents.

An integral part of Islamic culture is the prayer rug, which Muslims use at home and while traveling (Macey, 1961). The main purpose of the prayer rug is to ensure the cleanliness of the area where prayer is to be performed; this is one of the most important conditions for prayer (Ahmed, 1999). Before praying, Muslims direct themselves toward Mecca using a compass, then use prayer rugs as a symbol to point toward Mecca (O'Neal, 2007; Train, 1997).

Prayer rugs can be produced in a number of ways. Robinson (1982) noted that the typical, traditional method of manufacturing rugs is knotting and weaving by hand. Prayer rugs differ in both the materials used to produce the rugs as well in the manner of manufacturing. Furthermore, Meacy (1961) found that prayer rugs vary greatly in both style and coloring. Finally, different regions produce prayer rugs of varying thicknesses and sizes.

For the purposes of this research, thickness and size are particularly important because Muslims who travel during the day need portable prayer rugs to facilitate daily prayers. TÖNÜK (2011) indicates that “pocket-size portable prayer rugs” allow Muslims “to travel and accomplish their worshipping practice hygienically in an Islamically appropriate way” (p. 50). There are pocket-size, portable prayer rugs currently available in the market.

These portable prayer rugs are generally produced using the roller-printing method, which is different from modern digital printing methods such as inkjet printing. Inkjet printing allows for digital printing on a wide range of textiles, including cotton, silk, and wool (Bowles & Isaac, 2012). The use of digital printing technology to produce portable prayer rugs has many advantages compared to traditional printing methods, including cost, efficiency, and environmental benefits (Bowles & Isaac, 2012). For these reasons, inkjet printing will be the printing method chosen for this research.

The portable prayer rugs designed and printed using digital technology were evaluated using the FEA consumer needs model. The three main design criteria of this model are functional, expressive, and aesthetic. Functionality is related to the utility of a product (Lamb & Kallal, 1992, p. 43). For portable prayer rugs, functional aspects include portability and ease of use. “Expressive considerations relate to the communicative, symbolic aspects” of the product and are “culturally directed” (Lamb & Kallal, 1992, p. 43). There are symbols that express a connection to Islam, which include the *Kabah* and *Mihrab* – both of which will be described further in Chapter 2. The final criteria, aesthetic considerations, deal with “the human desire for beauty” (Lamb & Kallal, 1992, p. 43). The incorporation of Islamic ornamentation is aesthetically appealing to most Muslims.

In addition, the production and purchase of prayer rugs in this research were conceptualized in conjunction with the Islamic concept of *Zakat*. *Zakat* (almsgiving), as an essential feature of Islam involving direct or indirect charitable giving to the poor (Ahmed, 1999). “Alms (*zakat*) shall be only for the poor and the destitute, for those that are engaged in the management of alms and those whose hearts are sympathetic to the Faith, for the freeing of slaves and debtors, for the advancement of God’s cause, and for the traveler in need. That is a

duty enjoined by God. God is all-knowing and wise” (Qur’an 9:60). Prayer rug manufacturing can contribute to a social enterprise that allows low-income Muslim women to produce prayer rugs as a way of making money to improve their quality of life. According to White and colleagues (2012), ethical consumers who "are demanding ethical options such as fair trade products" prefer making purchases that contribute to the welfare of others (p. 103).

### **Purpose Statement**

The purpose of this study was to explore female Muslim consumer preferences related to digitally-printed portable prayer rugs in the context of the FEA consumer needs model.

For this study, the researcher digitally printed an image onto fabric to create a colorful, portable prayer rug. Then, the researcher measured the level of interest among Muslim women to purchase digitally printed portable prayer rugs for their functional, expressive, and aesthetic values. The researcher examined the idea of producing digitally printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women, simultaneously influencing the purchase decisions of socially concerned Muslim consumers.

### **Objectives**

1. Design and produce a series of eight digitally printed portable prayer rugs using motifs influenced by Islamic ornamental art to use as examples in this study.
2. Describe the sources of inspiration for portable prayer rug designs.
3. Measure the level of interest among Muslim women to purchase digitally printed portable prayer rugs for their functional, expressive, and aesthetic values.

### **Research Questions**

This work is guided by the following research questions:

1. Will Muslim female consumers be interested in purchasing digitally printed



portable prayer rugs?

2. Of the three dimensions in the FEA model (functional, expressive, aesthetic), which is the most influential in affecting the purchase behavior of Muslim female consumers?

### **Justification**

Muslims are required to perform ritual prayer (*salat*) at five appointed times each day, and prayer rugs are an essential part of fulfilling this obligatory ritual properly. Because many Muslims work outside the home, portable prayer rugs may be necessary to facilitate daily prayers. This is especially true for Muslims who travel or live in non-Muslim countries where work and recreational facilities are not designed to meet Islamic prayer conditions.

Due to the fact that the outlook of Muslim consumers has changed over time, it is important to develop prayer rug designs and materials that meet current Muslim consumers' needs. While Ahmed (1999) found that some employers in non-Muslim countries provide a clean place for Muslim workers to pray, not all contemporary facilities provide this option. Most Muslim countries provide clean spaces designed for prayer in both private and public buildings, including offices and airports.

Although there is a wealth of research regarding general Muslim consumer behavior, there is limited academic research focusing on the relationship between prayer rugs as an essential daily product and the consumers themselves. Therefore, the researcher of this study focused specifically on examining the relationship between portable prayer rugs and female Muslim consumers. The researcher also looked at the relationship between prayer rugs as an essential daily-use product and this product's target market, in terms of ethical consumption. According to Megicks, Memery, and Williams (2008), ethical consumption is defined as "the

conscious and deliberate decision to make certain consumption choices due to moral and personal beliefs” (p. 639). Finally, findings from this research will contribute to the literature associated with female Muslim consumers.

### **Assumptions**

1. Female Muslim consumers will be willing to participate in this consumer research related to digitally printed portable prayer rugs.

## CHAPTER 2- LITERATURE REVIEW

### **Background on Islam**

#### *Religion*

Islam is a monotheistic religion revealed to human beings through the last Prophet, Muhammad. The followers of Islam believe that there is no God but Allah; “there is only one God” (O’Neal, 2007; Tawfiq, 2014; Temporal, 2011, p. 4). Islam was founded in the early seventh century in Makkah or "Mecca," a city in the Arabian Peninsula in modern-day Saudi Arabia (O’Neal, 2007). In 610 AD, when the prophet Muhammad was about 40, he was given the first revelation from God by the angel Jabra’il (Gabriel) (O’Neal, 2007; Ahmed, 1999; Ahmed, 2002; Tawfiq, 2014). By the early seventh century, “Muhammad had been selected as the prophet of God” (O’Neal, 2007, p. 293) and “the prophet of Islam” (Ahmed, 1999, p.12). Thus, Muhammad is known as the messenger of God (Ahmed, 1999; O’Neal, 2007). According to Ahmed (2002, p. 15) and Tawfiq (2014), the prophet Muhammad “was the last, the seal, of the prophets, the final messenger of God.” Muhammad’s revelation is known as Quran. The Quran “is the message of God” (Ahmed, 1999, p. 28). The Quran is the main source of guidance and inspiration for Muslim people (Ahmed, 1999). Thus, the Qur’an and the prophet Muhammad, whom the Qur’an refers to as “an excellent example” (Qur’an 33:21), “provide the basis for the ideal type of Muslim behavior and thought” (Ahmed, 1999, p. 28).

The Quran explains the “Five Pillars” of Islamic religion, which are the core of Islamic obligatory ritual practice. The Five Pillars of Islam are: 1) the *Shahadah*, which is a declaration of faith to God: “I bear witness that there is no god but Allah) I bear witness that Muhammad is the Messenger of Allah”; 2) *Salat*, which is ritual daily prayer that is to be performed at five

prescribed times per day. *Salat* is distinct from *du'at* (petitions and supplications), which are other forms of non-obligatory non-ritual prayer; 3) *Zakat*, which is an annual charitable giving to the needy Muslims in society; 4) *Sawm*, which is fasting during the daylight hours of Ramadan, the ninth month of the Islamic calendar; and 5) *Hajj*, which is a pilgrimage to Mecca during Dhu al-Hijjah, the twelfth month of the Islamic calendar.

The five pillars of Islam create the guiding principles for Muslim life (Ahmed, 1999; Ahmed, 2002; Coon, 1966; Esposito, 1999; O'Neal, 2007; Siddiqi & Kassam, 2005; Tawfiq, 2014; Temporal, 2011). According to Ahmed (1999) and O'Neal (2007), these pillars are the foundation of Islamic religious belief and social practice (Ahmed, 1999; O'Neal, 2007). The purpose of the pillars of Islam is to remind Muslim people of their duty to their God. Thus, carrying out these obliged pillars “provides the framework of a Muslim’s life, and weaves his or her everyday activities and beliefs into a single cloth of religious devotion” (Temporal, 2011, p. 4). For the purpose of this literature review, the research will focus on the pillar of daily ritual prayer (*salat*).

### *Daily Prayer*

Daily ritual prayer (*salat*) is the second pillar of Islam. *Salat* is defined as “a ritually prescribed prayer in the Islamic faith” (Siddiqi & Kassam, 2005, p. 8,054). Siddiqi and Kassam (2005, p. 8,058) designate “the *salat* [as] a focal point of Muslim religious life” because “*salat* is primarily an act of ritual observance and submission to God’s law.” All Muslims recognize ritual prayer as an essential and obligatory component of the religion. For Muslim men and women who have reached puberty, it is obligatory to pray five times per day (for a broad overview sees Ahmed, 1999; Coon, 1966; Esposito, 1995; Esposito, 1999; O'Neal, 2007; Siddiqi & Kassam, 2005). In fact, the main purpose of ritual prayer is to remind Muslim people about the presence

of one God throughout the day (O'Neal, 2007), and the ritual prayer is a unique feature of Islamic practice (Esposito, 1995). Daily ritual prayer (*salat*) is central to the life of Muslims worldwide (O'Neal, 2007). In addition to the obligatory ritual prayer (*salat*), there is another category of prayer (*du'at*), which consists of petitions and supplications to God. While *du'at* are an important part of Islamic piety, they are not substitutes for the obligatory ritual prayer or *salat*. In order to avoid having to repeatedly distinguish between ritual prayer (*salat*) and non-ritual petitions and supplications (*du'at*), unless otherwise noted, this thesis employs the terms “prayer” and “daily prayer” for *salat*.

The intervals of ritual daily prayer are based on the position of the sun. The five prayer times are: 1) dawn, 2) afternoon, 3) late afternoon, 4) sunset, and 5) night (Ahmed, 1999; Coon, 1966; Esposito, 1995; Esposito, 1999, O'Neal, 2007; Siddiqi & Kassam, 2005; Robinson, 1982). In general, the act of ritual daily prayer involves a number of cycles of acts (units of prayer/*raka'at*), accompanied by specific postures. Each cycle (*ra'kah*) of the ritual daily prayer consists of a sequence of standing, bowing, kneeling/prostrating, and sitting (Coon, 1966; Esposito, 1995; Esposito, 1999; Khan, 2005; O'Neal, 2007; Siddiqi & Kassam, 2005) (see Figure 2.1). Specifically, the prayer at dawn has two cycles, sunset prayer has three cycles, and four cycles each at afternoon, late afternoon, and night (Coon, 1966). Accordingly, O'Neal (2007) classified the performance of ritual daily prayer as:

All prayer begin with the phrase “*Allahu Akbar*,” with the hands placed over the ears. This is followed by recitation (saying) of the first chapter of the Qur'an with the hands folded over the chest. Each person then recites a second passage from the Qur'an of his or her own choosing, followed again by “God is great,” then “Glory to my great Lord,” then “God hears those who praise Him,” all while bowing forward at the waist. The worshiper then stands upright, says “God is great,” then, on hands and knees with the forehead to the ground, says “Glory to My Lord, Most High” three times. Again, the worshiper says “God is great,” before rising to a sitting position. After saying “God is great” again, the worshiper bows forward with the forehead touching the ground. This is a “unit”

of prayer, or *ra'kah*. A second unit would follow the same pattern, except that a different, second passage from the Qur'an would be recited. (p. 312-313)

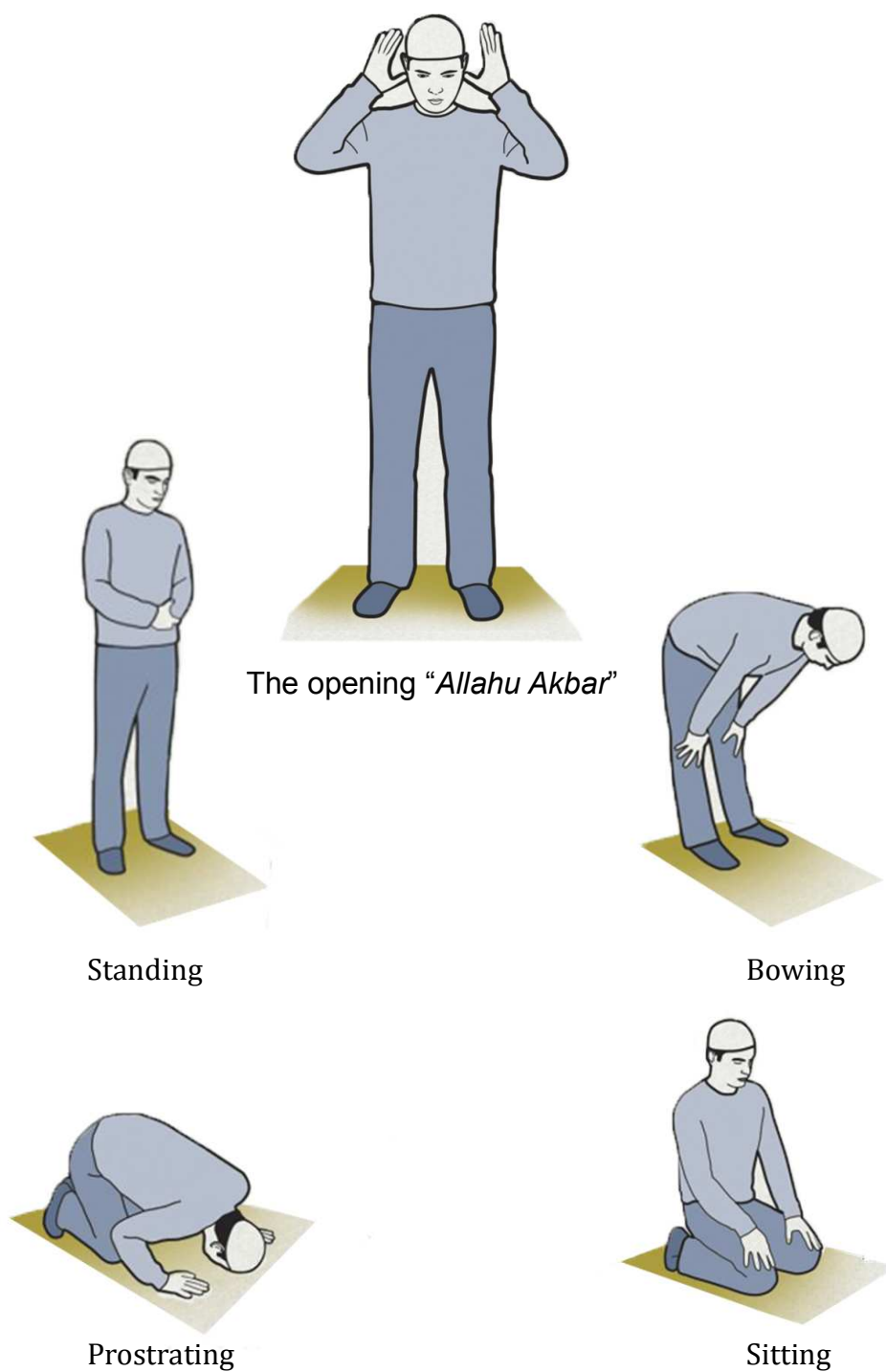


Figure 2.1 – Performance of ritual daily prayer (*Salat*)

The five daily prayers can be performed individually or in congregation with other worshipers, either with the family or at a Mosque, or in any clean location. Alexander (2004) and Khan (2005) defined a Mosque, an Islamic place of worship, as any private or public space properly prepared for the purposes of performing daily prayers. The Mosque is a term originated from the Arabic word *masjid*, which means a place of prostration (Alexander, 2004; Hitam & Talib, 2005; Khan, 2005; Robinson, 1982; Siddiqi & Kassam, 2005).

Daily prayers have specific requirements in addition to cleanliness. Requirements include conducting prayer on time, performing a ritual ablution, wearing appropriate clean clothing, facing Mecca, deliberating intention prior to prayer, and performing prayer with humility or modesty (Esposito, 1995; O'Neal, 2007; Siddiqi & Kassam, 2005).

There are two categories of ritual ablution. The major ablution (*ghusul*) is required when one is in a state of major ritual impurity in which one cannot perform the *salat* nor should he or she enter a mosque or even touch a Qur'an. Activities that required a man or woman to perform a major ablution in order to be restored to a state of ritual purity include sexual intercourse and touching a human corpse (Esposito, 1999). In addition, men must perform a major ablution after any emission of semen; women must do so after menstruation and after childbirth. The major ablution requires that one bathe from head to foot, making sure that every part of one's body is made wet.

The minor ablution (*wudu'*) is less complete, but is required after one has entered a state of minor ritual impurity from a range of unavoidable daily activities such as sleeping, relieving oneself, and passing gas. The minor ablution involves washing certain body parts with water in the following order: hands, mouth, nose, right forearm, left forearm, face, head, ears, right foot, left foot (Coon, 1966; O'Neal, 2007). Both the major and the minor ablution can be performed

with sand or with a stone in those instances where one has no access to clean water or if one should not touch water for medical or other reasons (Esposito, 1999).

In order to maintain the state of ritual purity, Muslims must avoid praying in any dirty location or touching the unclean ground while praying (Esposito, 1995; Coon, 1966; Siddiqi & Kassam, 2005; O'Neal, 2007). Muslims use prayer rugs to separate themselves from the floor, to ensure purity (O'Neal, 2007).

*Qibla* means the direction of prayer, in Islam, facing Mecca (Esposito, 1995; Gillow, 2010; Khan, 2005; Sandikci & Rice, 2011). Therefore, the *qibla* has always been an important religious identity marker. In order to identify the *qibla* direction (the direction of Mecca) in a space that does not include a physical marker or niche (*mihrab*), Muslims generally use a compass.

Muslims must perform prayer with humility or modesty. O'Neal (2007) indicates that, in order to perform prayer properly, Muslims must first achieve a humble mindset. According to Siddiqi and Kassam (2005, p. 8,058), “the majority of Muslims affirm that [prayer] *salat* is a means of purification and submission of the body, mind, and soul, and that embodies total surrender of the human being to God’s will.”

## **Prayer Rugs**

### *Importance of Prayer Rugs in Islamic Culture*

Prayer rugs are an integral part of each Muslim’s day. Muslims from different regions use different names to refer to the prayer rug, including *sajjada*, *Namazlik*, or prayer mat (Fauzie, 2009; Macey, 1961; Train, 1997). The researcher will use the term prayer rugs for this research.

The term “prayer rug” is described by Lewis (1914): as “any class of textile fabrics, and which has very appropriately been called ‘a creed in color,’ originated with the Mohammedans



of Asia Minor for the purpose of providing the worshiper with a clean place to offer prayer, as it is unlawful for a Moslem to kneel on an unclean place; therefore the prayer rug is his constant companion at home and abroad” (p. 31). In other words, “prayer rug” refers to the floor covering Muslims use to perform prayer and to keep clean and comfortable during prostration/kneeling when they are at home or traveling (Fauzie, 2009; Macey, 1961).

There are two types of prayer rugs. Milhofer and Paige (1976) refer to the first type of prayer rug as the multiple niches prayer rug (see Figure 2.2), which is designed to include a series of niches in a horizontal line. This kind of prayer rug is designed to be used by multiple worshippers who pray at the same time side by side. The multiple niches prayer rug is also known as the family prayer rug (Ford, 1992; Langton, 1904; Macey, 1961; Turkhan, 1969; Walker, 1999), allowing families to pray together (Lewis, 1914). The second type of prayer rug is the individual prayer rug (see Figure 2.3) that Muslims use to pray at home or elsewhere if they cannot go to pray at a Mosque or if they are travelling (Macey, 1961). In the past, prayer rugs were usually made by individuals, either for their personal use or to give as gifts (Fauzie, 2009; Langton, 1904).

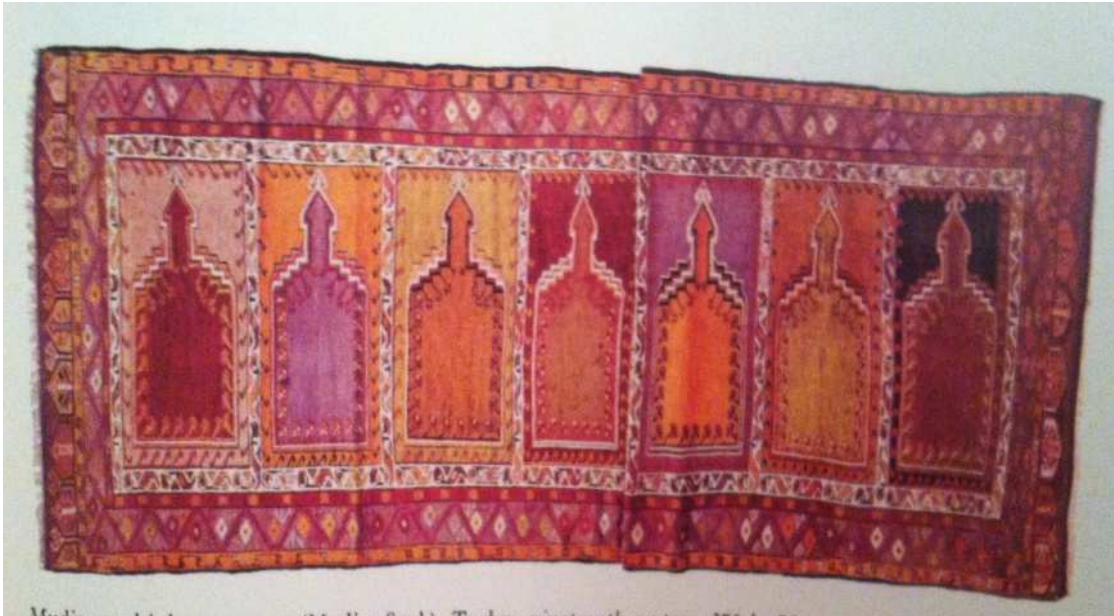


Figure 2.2 – The multiple niches prayer rug (family prayer rug).



Figure 2.3 – The individual prayer rug.

### *Patterns, Design Elements, Motifs of Prayer Rugs*

Prayer rug patterns should have a point at one end, and this pointed end is called the mihrab, the semicircular niche, which indicates the direction of Mecca (Blair & Bloom, 2004; Siddiqi & Kassam, 2005). The *mihrab* on the prayer rug is derived from the semicircular prayer niche in the wall of a Mosque that indicates the direction (*qibla*) of Mecca. According to Bamborough (1989), Lewis (1914), Macey (1961), and Train (1997), the niche of a prayer rug is intended to represent the features of every Mosque that point to Mecca (see Figure 2.4). The typical form of prayer rug depicts the *mihrab* niche (Bamborough, 1989; Con, 1966; Robinson, 1982). This element, always at the top, is the main element of a prayer rug's design pattern.

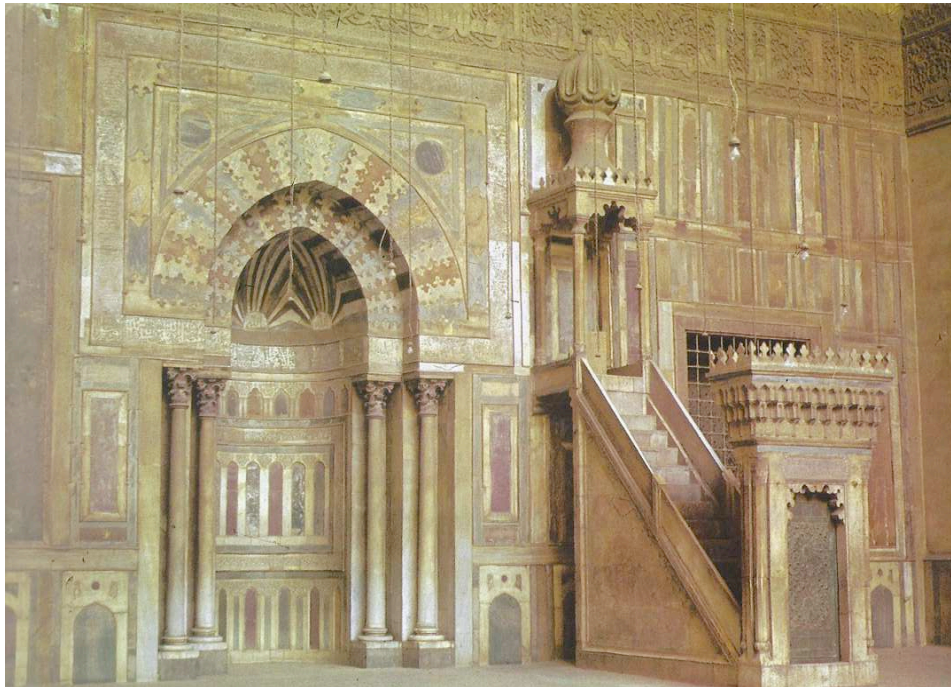


Figure 2.4 – The *mihrab*, or niche.

The main purpose of using the niche shape at one end of the prayer rug is to guide the Muslim designers as they apply different motifs, using the *mihrab* as pointer. According to

Macey (1961, p. 7), “A quite cursory examination of a number of different prayer rugs reveals the fact that the design of the field is asymmetrical; there is a point or arch at one end (the top) of the field, while the other end is usually straight, though it may be elaborated in few cases, but always leaving one end clearly delineated as a pointer.” Thus, the niche (*mihrab*) has a functional purpose: creating a clear visual direction in the prayer rug (Walker, 1999; Ripley, 1936) (see Figure 2.5).



Figure 2.5 – Prayer rug depicting the *mihrab*.

According to Bamborough (1989) and Bear (1998), prayer rug designs can be divided into two categories: geometric (by using interlacing geometric ornamental motifs) and curvilinear (by using ornamental plant motifs, such as floral motifs). According to Douglas (2002), Islamic ornaments are primarily geometric, vegetal, and calligraphic due to the general prohibition of portraying people and animals in Islam.

Muslim artists have created a unique form of Islamic ornamental art, called *Arabesque*. According to O'Neal (2007), the growth of the *Arabesque* as a part of Islamic art in distinctively religious space was a result of the discomfort with representing living things; therefore, Islamic art in general “is more abstract, meaning that it attempts to depict the meaning or spirit of things rather than their physical forms” (p. 317-318). Thus, *Arabesque* is commonly used in decoration (O'Neal, 2007). Nature has been a rich inspirational source for the Muslim artist for many decades, and many have translated personal observations of nature into complex interlacing curves (Albarn, Smith, Steele, & Walker, 1974; Schmidt, 2001) (see Figure 2.6).

According to Albarn, Smith, Steele, and Walker (1974) and Schmidt (2001), *Arabesque* involves interlacing ornamentation in layers, sometimes creating up to eight or nine different illusionary layers of pattern built on a geometric structure (see Figure 2.7). *Arabesque* is “deliberately fluid in nature, yet nevertheless governed by geometry” (Bear, 1998, p. 3). There are two definitions of *Arabesque*: “The basic unit of the arabesque, a favorite Islamic decorative theme, [which] may be described as split leaf seen in profile” (Train, 1997, p. 64) (see Figure 2.8) or “an eight-lobed (medallion) formed by interlaced tendrils” (Bamborough, 1989, p. 42). Muslim artists have incorporated the Arabesque method of embellishment with geometric and curvilinear motifs. According to Bosworth, Donzel, Heinrichs, and Lecomte (1995), the designs of the prayer rugs are “colorful and often profusely ornamented with geometric and stylized motifs” (p. 742).



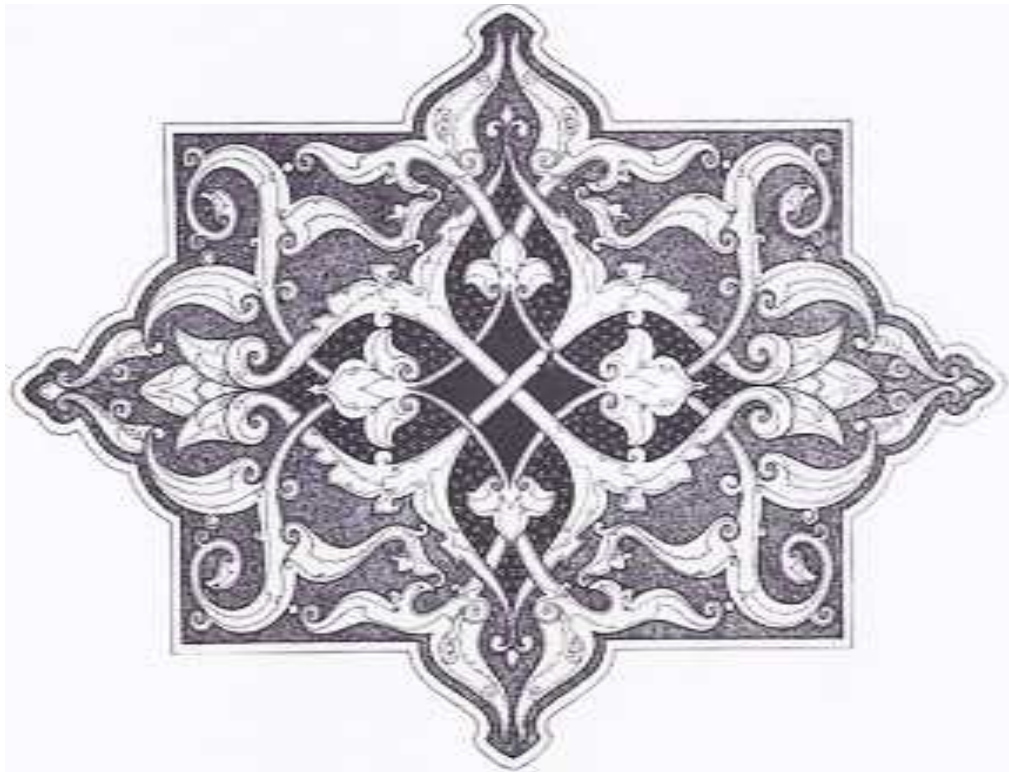


Figure 2.6 – Decorative panel design of *Arabesques*

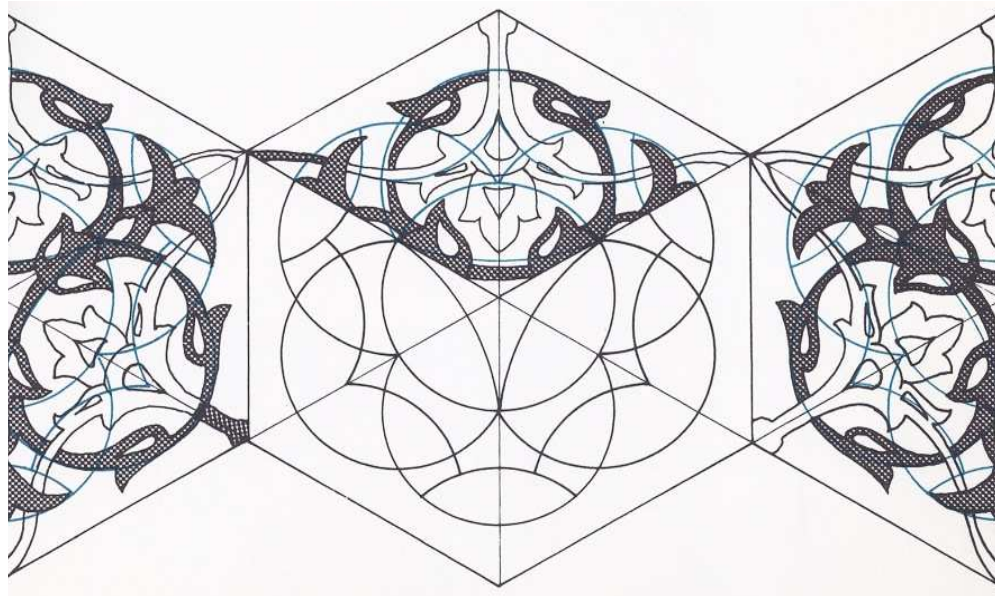


Figure 2.7 – *Arabesque* construction

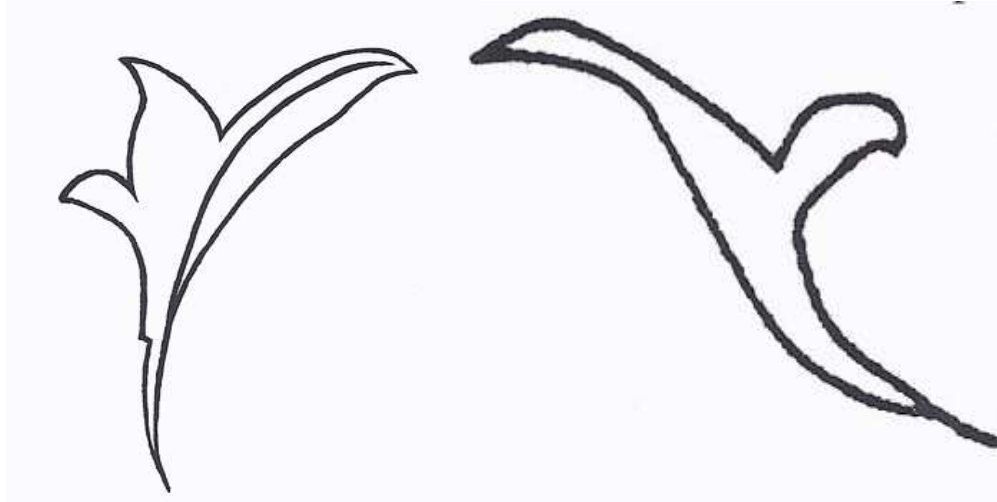


Figure 2.8 – *Arabesque* or Tendiril

Muslim artists are known to decorate the physical objects that surround them, incorporating elements of Islamic ornaments onto buildings, Mosques, furniture, textiles, carpets, and clothes. According to O'Neal (2007), prayer rugs were traditionally designed and decorated to appeal to religious and artistic aesthetics. Architecture has often been an inspiration for art of other forms (O'Neal, 2007). Muslim artists use Mosques as a primary source of inspiration when creating prayer rug designs. Ford (1992), Craycraft and Anderson (1983) give some examples of oriental prayer rugs that depict the different forms of Mosques (see Figure 2.9 & Figure 2.10).



Figure 2.9 – Oriental prayer rug depicting a Mosque.

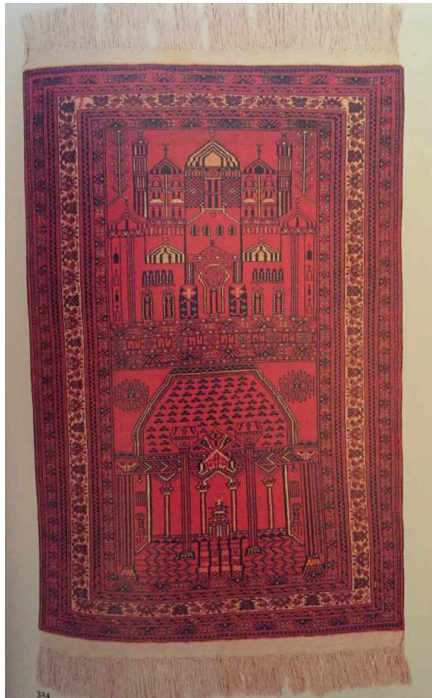


Figure 2.10 – Oriental prayer rug depicting a Mosque.



Because modern lifestyles do not always allow for prayer to be performed in a Mosque, representing some of the Mosque's features by incorporating them into the design of prayer rugs has been met with appreciation by Muslim consumers. Most prayer rugs represent a prayer niche (*mihrab*) similar to that of the style of a particular Mosque. Hitam and Talib (2005) and Khan (2005) identify the three primary Mosques in Islam: *Al-Masjid Al-Haram* (the Sacred Mosque of Mecca) (see Figure 2.11), *Masjid al-Nabawi* (the Prophet's Mosque/the Mosque of *Quba*) in Medina (see Figure 2.12), and *Masjid al-Aqsa* (the Al Aqsa Mosque) in Jerusalem (see Figure 2.13).



Figure 2.11 – *Al Masjid Al-Haram* (the Sacred Mosque of Mecca).



Figure 2.12 – *Al Masjid al-Nabawi* (the Prophet's Mosque in Medina).

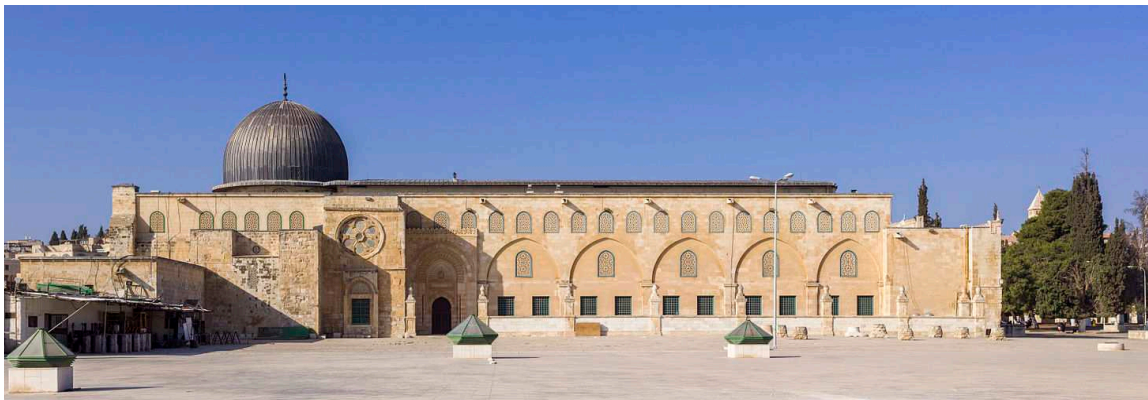


Figure 2.13 – *Al Aqsa Mosque* (in Jerusalem).

The Sacred Mosque of Mecca (*Al-Masjid Al-Haram*) houses the primary holy site for all Muslims, the *Kabah* (see Figures 2.14 & 2.15). The *Kabah*, now covered with black and gold cloth, is a simple cube-shaped building located at the heart of the Great Mosque in Mecca, and Muslims regard it as God's first dwelling on earth that was constructed by Abraham and his son Ishmael (Ahmed, 1999; Douglas, 2002; O'Neal, 2007; Sandikci & Rice, 2011). The *Kabah* is the

focal point of the week’s religious activities, including daily prayer and Friday prayer (O’Neal, 2007). Wiegers (2004) notes “the [*Kabah*] and the Holy City of Mecca play a very important role as symbolic center in several kinds of religious behavior” such as the obligatory ritual prayer and pilgrimage (*Hajj*) as well as the praiseworthy but not obligatory *Umra* (p. 561). Hence, *Kabah*, a symbol derived from the Sacred Mosque of Mecca, is an essential element of prayer rug design.

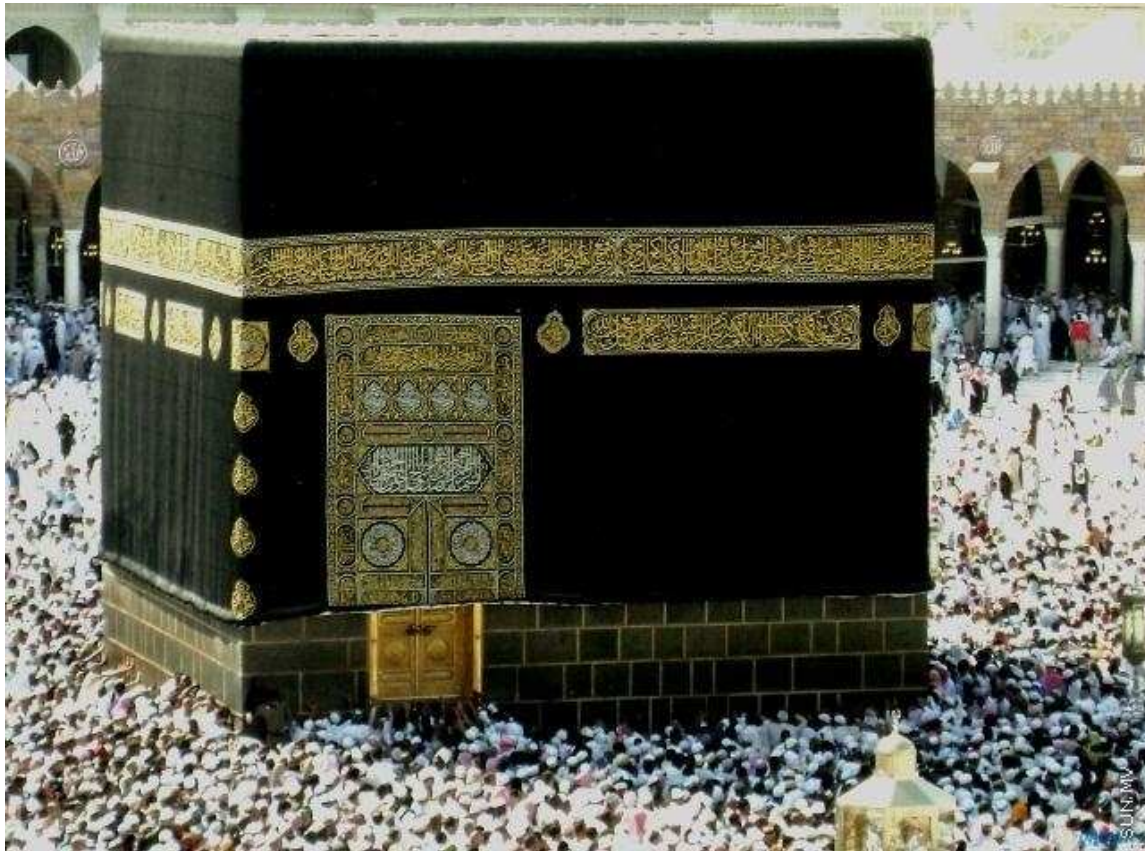


Figure 2.14 – The *Kabah* is covered with black and gold cloth.





Figure 2.15 – The *Kabah* is located at the heart of the Great Mosque in Mecca.

### *Manufacture of Prayer Rugs*

Knotting is the most common traditional method to produce prayer rugs (Macey, 1961). Woven rugs are known as tapestry-woven rugs, while knotted rugs are known as pile rugs (Turkhan, 1969). There are two types of knots used in oriental prayer rugs: the Ghiordes knot and the Senne knot (Robinson, 1982; Turkhan, 1969). According to Macey (1961) and Turkhan (1969), the Ghiordes knot is usually called a Turkish knot, while the Senne knot is called a Persian knot. Robinson (1982) and Turkhan (1969) indicate that the Ghiordes is generally used in Turkey and Caucasus, while the Senne is largely used in Iran, and south and central Asia. Turkey was the first known location of prayer rug production. According to Macey (1961) and Turkhan (1969), prayer rugs are still most commonly found in Asia Minor (Turkey).

There are five major carpet-producing regions in the Islamic world: Iran, South Asia, Turkey, the Caucasus, and Central Asia (Robinson, 1982). The production of prayer rugs is centralized in Persia, Turkey, the Caucasus, Central Asia, Afghanistan, Baluchistan, and Pakistan (Macey, 1961). There are varying sizes and compositions of prayer rugs across different regions, but the typical prayer rug size is approximately 4.0 ft. × 2.7 ft. (121 cm × 82 cm) (Ford, 1981). Esposito (1999) notes that wealthy Muslims are known to use prayer rugs made of high quality materials such as silk and fine wool.

According to Bosworth, Donzel, Heinrichs, and Lecomte (1995), in the late 13th/19th century, printed cotton prayer rugs were made in India for the masses at very low cost using the block printing technique, which then moved through Persia to Turkey. Baker (1995) notes that Iran also participated in textile printing, but Iranian printed cottons had a limited market compared to Indian prints. Baker detailed one particular Iranian prayer rug produced in the second half of the 19<sup>th</sup> century, made of plain weave, which incorporated printing methods such as resist dye, woodblock stamping, and hand painting (1995). The block printing method was also used in Turkey. According to Gillow (2010), Turkish artists used wooden blocks to produce cotton prints in two, three, or four colors, and some of this block printing is found on prayer rugs with decorative floral *mihrab* (see Figure 2.16). Since the block-printed textile is less expensive to produce and purchase, Muslims often choose prayer rugs printed in this manner for everyday use (Douglas, 2002).



Figure 2.16 – Block-printed prayer cloth from Istanbul, Turkey.

An earlier method of prayer rug production is referred to as the patchwork technique, regarded as the simplest technique for producing such rugs. Ripley (1936) defines the decorative patchwork method as the process of sewing bits of cloth onto a plain-woven material. Gillow (2010) gives an example of a woman's prayer rug that is made of embroidered patchwork to indicate the *qibla* (the direction of prayer) (see Figure 2.17). For many years, embroidered patchwork prayer rugs were hand-made by women at home.



Figure 2.17 – Patchwork of old embroidery made into a woman’s prayer cloth indicating *qibla*.

Over the years, the manufacturing of prayer rugs has transitioned from small-scale, artisan production to machine production using computer technologies. Eidiwany, Ghani, Ghanem, and Elmenshawy (2010) classify three types of machine-made rugs: woven rugs, tufted rugs, and non-woven rugs.

### **Recent Trends in Prayer Rugs**

#### *Portable Prayer Rugs*

In modern society, many Muslims travel or are outside of their homes for work and need portable prayer rugs to facilitate daily prayer. It is not acceptable for Muslims to kneel on an unclean place. TÖNÜK (2011) notes, “for people who are mobile during the day, and who need to perform their *salat* in different places, there are pocket-sized portable prayer rugs, so that they can both feel free to travel and accomplish their worshipping practice hygienically in an

Islamically appropriate way” (p. 50). These pocket-sized portable prayer rugs are currently available in the market (see Figure 2.18).



Figure 2.18 – Pocket-sized portable prayer rugs.

The main printing method used in production of pocket-sized portable prayer rugs is the traditional roller-printing method, in one color. The designs of these rugs are printed on two kinds of textiles: polyester fabric or non-woven fabric. Polyester pocket-sized portable prayer rugs are of better quality than non-woven pocket-sized portable prayer rugs because the non-woven fabric can split and tear easily after a few uses. However, the color of printed designs on both polyester pocket-sized portable prayer rugs and non-woven pocket-sized portable prayer rugs fades after several uses. The lockstitch technique is used to finish the edges of pocket-sized portable prayer rugs.



Currently available pocket-sized portable prayer rugs are principally produced using the roller-printing method in one color to print the entire design of the rug; however, more colorful rugs can be created using the inkjet digital printing method. Thus, the researcher in this study will use the inkjet digital printing technology in a new application to produce colorful, lightweight portable prayer rugs, which do not currently exist in the market.

In terms of functionality, currently available pocket-sized portable prayer rugs are produced using the roller-printing method, and the color of printed design fades after minimal use. Further, current pocket-sized portable prayer rugs are made of one layer of low quality material, which does not provide the user adequate protection from the floor and tears easily.

#### *Prayer Rugs Designed Using Computer-Aided Design*

Computer-aided-design (CAD) has shortened the manufacturing and production process of prayer rugs (Dwivedi & Dwivedi, 2013). CAD refers to the use of computer technology to aid in the design of a specific product. Consequently, “Computer based information technologies have been extensively used to help both designing and manufacturing industries manage their processes and information systems to focus their efforts on increasing the overall efficiency and meet the customer’s requirements” (Dwivedi and Dwivedi 2013, p. 174).

More specifically, the functions of computer-aided design (CAD) software increase the productivity of designers and improve the quality of design. According to Ujiie (2011), the abilities of the computer to assist the textile designer’s creative process and to facilitate production are the fundamental roles of computer technology. Dwivedi and Dwivedi (2013) define CAD as “a process of use of computers in creating, analysing, modifying, optimizing, and drafting/documenting a product’s data so as to achieve its design goal efficiently and effectively” (p. 176). Furthermore, Lamar (2011), presents some advantages of using textile design software

(Textile-CAD) as one of several digital tools: the ability to copy, transform, and paste design elements, and the ability to rapidly and easily explore many repeating design structures compared to the manual method of textile design.

The process of designing rugs – and prayer rugs, specifically – takes a vast amount of time and effort. Due to the variation of rug sizes, from very large for the audience halls in palaces to narrow and long prayer rugs for the rows of worshipers in Mosques (Douglas, 2002), computer-aided design systems (CAD) have become important tools during the design stage. Worcester (1999) describes the differences between designing carpet by hand and designing carpet using CAD, and how the use of electronic software packages has advanced the carpet industry. Designers could traditionally spend a week and a half creating one small carpet design, while they could create the same design in a few hours using computer-aided design software. Thus, “CAD plays a vital role in both textile designing and fabric simulation” (Dwivedi & Dwivedi, 2013).

CAD software programs, such as Adobe Photoshop, Illustrator, and Lectra, are quality platforms for textile design. According to Bowles and Isaac (2012), these software programs have become the industry standard tools for textile designers, offering designers the freedom to work with both vector drawing and pixel drawing and the ability to create accurate, detailed designs. This researcher used the Lectra system to generate a series of eight portable prayer rug designs.

CAD software allows designers to generate color variations of a specific design in a short period of time and conduct comparisons to determine which variation is most appropriate for use in that design. Later, they can send the selected color way to the next stage of the production. According to Dwivedi and Dwivedi (2013), “Textile-CAD is used to design fabrics and fabric

variations, and to simulate quickly their final appearance through prints reproducing faithfully their colour and structure” (p. 176).

Computer-aided design reduces the timeline and the cost of prayer rug sample production. Busch (2005) indicates the importance of using computer-aided design in the carpet industry by showing an example of how the use of computer-aided design in carpet manufacturing has reduced the cost of making the first sample of carpets. The reduced cost of making the first sample set of rugs has a significant impact on the annual total expenses for a factory. Factories save money annually using computer-aided design to create rug samples and textile design croquis (color drawings) instead of creating traditional physical prototypes.

These programs also provide designers the opportunity to see the final form of their carpet designs before producing physical finished samples. Ujiie (2011) mentions that the incorporation of computer technology helps in generating more samples within a short timeframe compared to the manual method of sample production. Lamar (2011) indicated “CAD can facilitate more cost-effective production,” which helps manufacturers “reduce the amount of physical sampling, in turn reducing product development time and sampling costs” (p. 344). Furthermore, the use of CAD in the product design and development life cycle can replace a variety of prototypes and testing with virtual models (Dwivedi & Dwivedi, 2013).

#### *Designing Prayer Rugs Using Digital Textile Printing*

Digital printing technologies have changed the nature of textile design. “Over the past decade, one of the most promising technological breakthroughs in the textile arena has been the development of and advancements made in digital printing” (Hodnett, 2014, p. 1). Bowles and Isaac (2012) state that digital textile printing is the most significant advance in fabric-printing technology. Traditional printing techniques can be combined with digital printing techniques to

create innovative finished products. In order to fully understand the development of the portable prayer rugs used in this research, it is necessary to first provide some background about the digital printing technologies utilized.

Digital printing technology has been defined by Bowles and Isaac (2012) as “a generic term used to describe all methods of printing where a digitized image is transferred onto the substrate” (p. 178). Digital textile printing technology refers to “a number of integrated software and hardware components that are typically used to create digitally printed fabrics” (Parsons, & Campbell, 2004, p. 89). Inkjet digital printing is suitable for printing on fabric, and will therefore be the printing method used in this research.

Inkjet digital textile printing is defined by Bowles and Isaac (2012) “as a process by which the described pattern is built up by projecting tiny drops of ‘ink’ of different colors, in predetermined micro-arrays (pixels), onto the substrate surface” (p. 172). Inkjet printing technologies produce a spectrum of colors using print heads of four main colors: cyan, magenta, yellow, and black (Cie, 2015; Polston, Parrillo-Chapman, & Moore, 2015; Provost, 1994; Tyler, 2011). “Colors are mixed by a process method; that is, not premixed but mixed as required from combinations of [four colors] of ink. [The process of mixing CMYK colors] allows a far greater range of colors within a single printed image as well as gradients of shade within a color or between several” (Cie, 2015, p. 32). The CMYK color gamut produces similar saturation to that of the traditional screen-printing method.

Digital printing, in general, is incredibly accurate. The inkjet digital textile printing technique enjoys few limitations in the complexity of designs that may be accurately produced and re-produced, expanding designers’ creative possibilities. However, using the digital printing method has removed the restrictions that textile designers have usually faced, so they become

freed from concerns about color separation and pattern repeat, which are key considerations in both of screen and roller printing (Bowles & Isaac, 2012; Briggs-Goode, 2013; Polston, Parrillo-Chapman, & Moore, 2015; Tyler, 2011). Digital printing enables designers to print repeat or non-repeat designs with a high level of complexity on any scale using hundreds of colors. Ujiie (2011) indicates, “Production inkjet textile printers can print any digital textile design created by CAD software directly onto cloth” (p. 255).

The use of digital printing technology has many advantages over traditional printing methods, including cost savings, increased efficiency, and lessened environmental impact. Bowles and Isaac (2012) recognize the four major advantages of digital printing versus traditional printing methods as: 1) lessened environmental impact, 2) the possibility of producing very large-scale images, 3) the ability to print intricate details and millions of colors, and 4) the speed of translation of the design onto fabric. In comparison to specific methods such as screen-printing, digital printing has advantages in speed, efficiency and lower costs for smaller manufacturing runs (Bowles & Isaac, 2012; Briggs-Goode, 2013).

Using traditional methods of printing, such as rotary printing and stenciling (including silk-screen and woodblock) requires a separate template for each color, as each color must be laid down separately. Therefore, the more colors used in the design, the more expensive the finished product becomes, as production takes a considerable amount of time. Briggs-Goode (2013) indicates that “digital printing does not require colour separation or engraving of multiple screens, so costs per meter, in theory at least, are the same whether you need to print 5 or 500 meters” (p. 142). Consequently, according to Briggs-Goode (2013), Polston, Parrillo-Chapman and Moore (2015), and Provost (1994), inkjet digital textile printers reduce expenses and time

involved in the sampling stage and color way/sample selection, thus shortening the time it takes to reach the mass production stage.

Inkjet digital printing is regarded as environmentally friendly because it uses less dye, water, and energy; this is an important consideration for designers and manufacturers when choosing which method of printing is best suited to large-scale production. To be exact, “Inkjet printing is reported to use 30 percent less water and 45 percent less electricity than conventional printing methods” (Bowles & Isaac, 2012; Briggs-Goode, 2013).

Adopting the inkjet digital printing technique as an environmentally friendly production method is intertwined with design responsibility and consumer preferences. Briggs-Goode (2013) suggests designers should be more aware of social responsibility and promoting industry standards that are environmentally friendly. Choosing the inkjet digital printing method to produce portable prayer rugs gives designers the ability to scale the design of the prayer rug to any prayer rug pattern dimensions, resulting in fewer wasted materials.

According to Polston, Parrillo-Chapman, and Moore, (2015) “Inkjet digital textile printing is an emerging technology that offers product development opportunities for a number of niche markets” (p. 87). Inkjet digital textile printing has the potential “to supplement, and in some instances replace, conventional screen-printing in established markets and to create wholly new markets for textile products” (Polston, Parrillo-Chapman, & Moore, 2015, p. 87).

Environmental responsibility is one reason the researcher of this study has chosen to use the inkjet digital printing method in prayer rug production, joining a growing number of businesses that take the social responsibility approach - minimizing cloth waste, reducing energy consumption, and paying fair living wages (Briggs-Goode, 2013).

### *Use of Electronic Devices Embedded in Prayer Rugs*

Prayer rugs, as products, have seen advancements with technological developments. Some recent innovations in the prayer rug sector are the EL Sajjadah 1426 (“Illuminating Prayer Mat”), memory prayer mat (“Prayer mat with prayer monitoring system”), and orthopedic prayer mat (“The world’s first physiological prayer rug”) products. Most of these innovations have been patented.

***EL Sajjadah 1426 “Illuminating Prayer Mat.”*** EL Sajjadah 1426 is an illuminating prayer mat invented by Soner Ozenc (Kaye, 2012; Yanko design, 2005). In the product name, 'EL' refers to ‘Electro Luminescent,’ the word ‘*sajjadah*’ means ‘prayer rug,’ and the number ‘1426’ refers to ‘2005’ in the Islamic calendar (Yanko design, 2005; Kickstarter, 2012). The *EL Sajjadah* 1426 as an Islamic product has specific characteristics. According to Abouelsaadat (2014), Kaye (2012), and Kickstarter (2012), *EL Sajjadah* 1426 is described as an electroluminescent prayer rug that lights up when facing the direction of Mecca (see Figure 2.19).

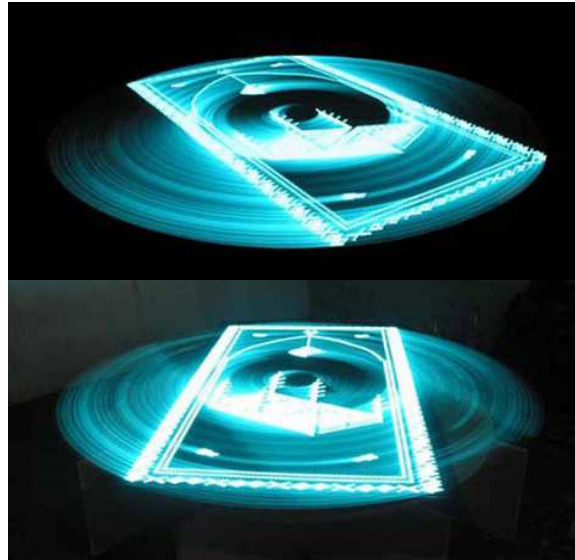


Figure 2.19 – *EL Sajjadah 1426* “Illuminating Prayer Mat.”

Since all Muslims face Mecca in order to perform prayer, the *EL Sajjadah 1426* prayer rug was embedded with a digital compass module that indicates the correct direction of prayer by illuminating patterns on the prayer rug. According to Yanko design (2005), the *EL Sajjadah 1426* “indicates the direction via the data coming from a compass module embedded inside it” (p. 1). The technology that is used to achieve the effect of lighting up the pattern of the prayer rug was developed through the application of electroluminescent phosphor printing technology (Yanko, 2005). More specifically, “Wire embroidery - *Electro Luminescent Phospor Printing Technology* - is woven into the rug for sensory perception” (Yanko, 2009, p. 1) (see Figure 2.20).

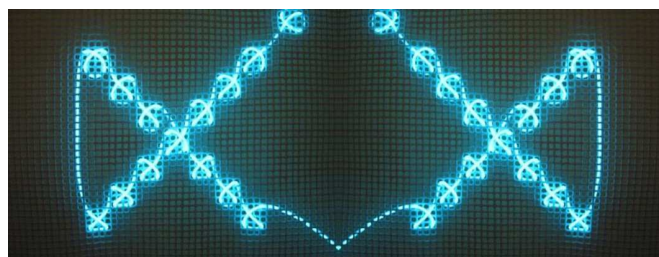


Figure 2.20 – EL ‘Electro Luminescent’ wires woven into the rug.



The woven electroluminescent fibers of *EL Sajjadah* 1426, which glow and brighten the entire rug design as the rug points closer to the direction of Mecca, respond to the user's orientation (Abouelsaadat, 2014; Kaye, 2012; Yanko, 2005) (see Figure 2.21).

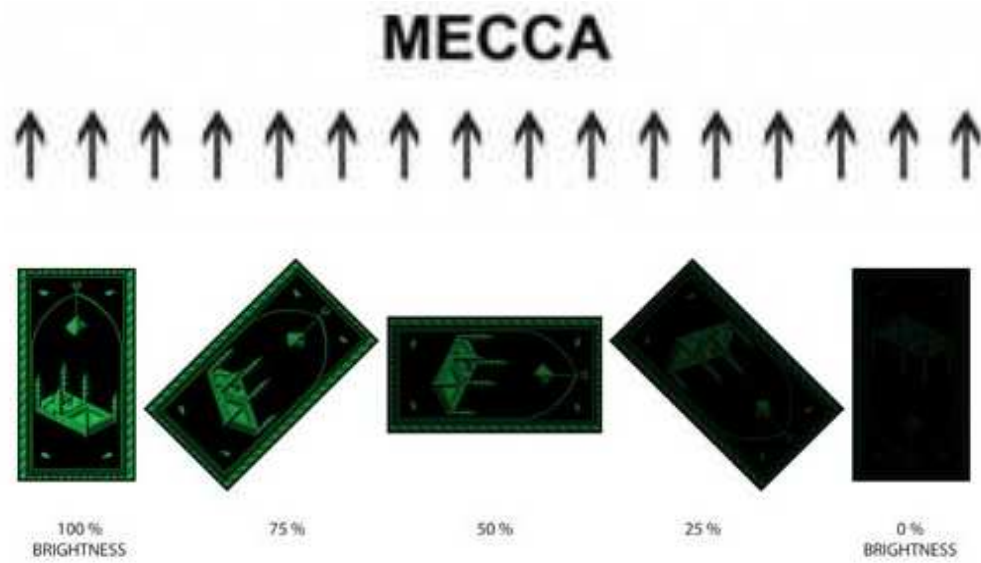


Figure 2.21 – The brightest illuminated pattern of *EL Sajjadah* appears when facing Mecca.

However, illumination of *EL Sajjadah's* surface as a functional feature may distract users from their prayer (see Figure 2.22). Abouelsaadat (2014) indicates that the concentration of the user could be affected when the prayer rug turns into a display object, and heat generated by the luminescent fibers might render the system unusable until it has cooled down from a previous use. However, the illuminated surface of the *EL Sajjadah* rug grants it a secondary use as a decorative night-light wall hanging. The *EL Sajjadah* 1426 has functional and practical features and can be displayed as a unique piece of art (Kickstarter, 2012).



Figure 2.22 – The rug surface design of the *EL Sajadah* 1426 lights up when facing Mecca.

Producing the *EL Sajadah* 1426 was very expensive. According to Kickstarter “For an Early Bird offer of \$500, essentially, [the customer] will be pre-ordering the *EL Sajadah* mass production version, and have the privilege of being one of the first to get hold of it” (p. 1). However, this product did not have sufficient funding to bring it to the mass production stage. Only one version of this *EL Sajadah* product was purchased. The Museum of Modern Art in New York has purchased the first prototype of *EL Sajadah* to present in their ‘Talk to me’ exhibition (Kickstarter, 2012).

Since one of the purposes of using a prayer rug is bringing the atmosphere of a Mosque to wherever users take their rug, the surface design of *EL Sajadah* has presented some of the

Mosque features, such as depicting the *mihrab* and the exterior silhouette of a Mosque.

According to Kickstarter (2012), the Mosque pattern presented at the center of *EL Sajjadah* (the prayer rug) “was drawn pixel by pixel by looking at a small scale model of the Blue Mosque in Istanbul” (see Figure 2.23) (p. 1).

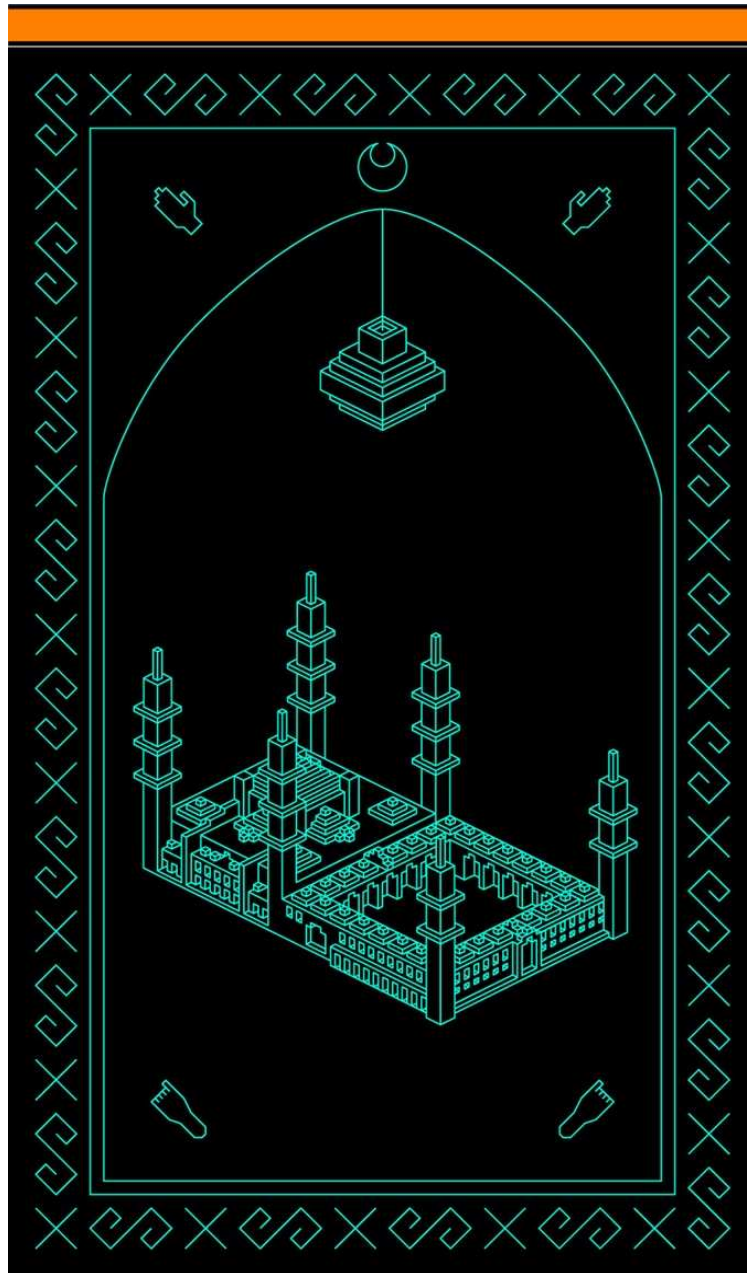


Figure 2.23 – The surface design of *EL Sajjadah* 1426 “Illuminating Prayer Mat.”

Additional motifs have been depicted in the *EL Sajjadah* design to serve a functional purpose: the hand and foot designs. According to Kickstarter (2012), “Hand and foot patterns [on the *EL Sajjadah* 1426 “Illuminating Prayer Mat”] indicate where to place hands and feet” (p. 1). The design of the *EL Sajjadah* prayer rug consists of two colors: black and teal. The teal color (a deep blue-green), one of the Islamic holy colors, is used in the design of *EL Sajjadah*, while the black represents the Holy *Kabah* in Mecca. (Kaye, 2012; Kickstarter, 2012).

Due to the need for electric power to operate the *EL Sajjadah* prayer rug, its use is limited. In order to operate the *EL Sajjadah* prayer mat, the user must either have access to an electrical outlet or rechargeable batteries for power. Hence, the users will be unable to see the design of the prayer mat or use its compass capability without one of these resources available, limiting its portability.

**Memory Prayer Mat “Prayer Mat with Prayer Monitoring System.”** Muslims are required to perform prayer five times daily, and each prayer requires a specific number of cycles to be completed. Syed Jamal invented a prayer mat with a prayer monitoring system that can count the cycles of each daily prayer (Jamal, 2010) (see Figure 2.24).



Figure 2.24 – Memory Prayer Mat: “Prayer mat with prayer monitoring system.”

This innovative prayer mat is known commercially as the ‘MPMAT’ (“Memory Prayer Mat,” 2012). Jamal (2010) describes the memory prayer mat as “an elongated prayer mat [that has] a first end and a second end, which have [four tactile sensors with] a top layer for concealing each of the tactile sensors, and a microprocessor for receiving electrical signals from the tactile sensors, and for displaying the progress of prayer steps on a display device” (p. 1).

The main purpose of this mat is to assist both the elderly, who can forget the sequence of the daily prayer, and children who have just started learning to pray. According to Jamal (2010), since each of the daily prayers requires a different number of cycles and each cycle is carried out in different sequences, it is not easy to keep track of all steps required for daily prayers.

**Orthopedic Prayer Mat “The World’s First Physiological Prayer Rug.”** Nader Sabry invented the orthopedic prayer mat in 2011 (United States Patent Sabry, 2014) (see Figure 2.25).



Figure 2.25 – The orthopedic prayer mat: “The world’s first physiological prayer rug.”

Most of the experimental research and design development of the orthopedic prayer mat was undertaken in Canada, where the TIMEZ5 labs are located; the manufacturing is done in Asia, and the company is based in the Middle East. The orthopedic prayer mat has achieved a significant impact on the physical well being of those who use it (Huffington Post, 2013). This prayer rug is marketed to people who have health considerations and to those with loved ones who have health considerations that may interfere with their physical ability to perform prayer rituals. According to the TIMEZ5 website, the cost of this prayer mat is \$270 without shipping, which adds approximately \$90 to the final cost.

The orthopedic prayer rug is generally marketed to people with flexibility problems due to pregnancy, joint pain, excess weight, or bad posture (Huffington Post, 2013). According to the Huffington Post (2013), this prayer mat has five main benefits: it helps lessen pain and stiffness, makes posture better, increases energy during prayer, is cool and hygienic, and does not slip. To

achieve these benefits, this prayer mat is made with several layers of technologically advanced textiles, each of which serves a different purpose.

The top layer “is made of microfiber, which is antimicrobial, anti-molding, water-resistant, anti-dust, and heat-resistant,” to keep the mat hygienic and cool to the touch (United States Patent Sabry, 2014, p. 1). One inner layer is a “soft polyurethane layer,” which “reduces the pressure and reduces the stiffness on [the user’s] leg, ankle, loins, and muscle to ease stress and improve blood circulation”; it further allows the user to “see his posture for corrective purposes” (United States Patent Sabry, 2014, p. 10). Another inner layer, which is an “anti-fatigue layer,” is “arranged under the soft polyurethane layer for bearing/absorbing the user’s weight” (United States Patent Sabry, 2014, p. 11). The bottom layer is the anti-slip layer, which is used to keep the mat from slipping (United States Patent Sabry, 2014) (see Figure 2.26).



Figure 2.26 – The world’s first physiological prayer rug has a multiple layered structure.



## **The Muslim Consumer**

Consumers of Muslim background have been increasing in number in recent decades. According to Alserhan & Alserhan (2012, p. 131), “[The] Muslim consumer group is not limited to one country, but instead exists in economically feasible numbers in the majority of the countries in the world.” Abuznaid (2012, p. 148) notes, “Muslim consumers constitute about one quarter of the total world population and represent a majority in more than 50 countries.”

According to Ahmed (1999) and O'Neal (2007), Islam is the most important religion of the Middle East, North Africa, and Southeast Asia. Furthermore, Esposito (1999) indicates that the reach of Islam extends across the globe, and it is expected to become the second- or third-largest religion in Europe and the Americas. Additionally, Kettani (2010) found that since the 1970s, the Muslim population has grown 40% faster than the world population. Therefore, the Muslim population “is expected to increase by over one percentage point each decade, reaching one out of four by 2020 and one out of three by 2075” (Kettani, 2010, p. 12).

According to Sandikci (2011), the Islamic market is a viable market segment and the increase in visibility of Muslims as consumers is intimately connected with their purchasing power. For instance, Arab consumers “spend an average of 49 percent of the regional GDP” (Mahajan, 2012, p. 27).

It is important to recognize that Muslim consumer needs are changing. New products and specifications are required to meet consumers’ needs. According to Mahajan (2012, p. 27), “The Arab world is increasingly consumer driven, and with that trend its residents have become increasingly demanding of the products they buy and use.” One example is “the West Bank shoppers who buy global products – the vast majority of Arab consumers today spend their money on high-quality goods from virtually any company that makes an effort to understand



their wants and needs” (Mahajan, 2012, p. 27). Thus, without doubt, Muslim consumers are one segment of global consumers that has increased rapidly in previous years in both size and spending power (The Business Times Singapore, 2013). Sandikci (2011) points out that Muslim consumers now are “considered to be a highly attractive market segment” (p. 1). Therefore, Sandikci (2011) suggests that firms interested in the Islamic market focus on the daily practices of Muslim consumers for which the product may be relevant.

## **Muslim Consumer Behavior**

### *Ethical Consumption*

**Ethical Products.** There are three essential motivators that guide the purchase decision of any consumer: product quality, customer service, and promotions and pricing. According to Megicks, Memery, and Williams (2008), “customer service, product quality and promotions are important motivators of shoppers even when they are looking for ethical and socially responsible solutions” (p. 637). There is a strong link between social responsibility and ethical production of products and consumer preference, “which is the conscious and deliberate decision to make certain consumption choices due to moral and personal beliefs” (p. 639). According to White and colleagues (2012), there are a number of consumers who “are demanding ethical options such as fair trade products” (p. 103).

**Ethical Consumers.** The term ethical consumer has been defined differently by several authors. According to Al-khatib, Vitell, Rexeisen, and Rawwas (2005), “Consumer ethics has been defined as the moral rules, principles and standards that guide the behavior of an individual or group in the selection, purchase, use, or sale of a good or service” (p. 502). Muncy and Vitell (1992) give more in depth information about the ethical consumer, while White and colleagues (2012) point out that there are many consumers who are concerned with justice for other people,

and who could play an important role in encouraging other consumers to purchase products that are characterized by ethical attributes. Fair trade evaluations rest on considerations such as treatment of workers (including fair wages) and whether consumers' purchasing power translates to improved living conditions for these workers (Littrell & Dickson, 2010).

Consumers are willing to pay for ethical products if the high price of these products is deemed necessary for conforming to ethical conditions (McGoldrick & Freestone, 2008; Tutolo 2011; White et al., 2012). Niinimäki and Hassi (2011, p. 1878) indicate that, when they asked the participant consumers in the questionnaires of their study "if the environmental impact as well as ethical manufacturing and safety issues" affected their textile purchasing decisions, the participants' responses demonstrated that female consumers consider both environmental and ethical consumption aspects to be important guidelines for purchasing decisions, more so than men.

**Consumer Social Responsibility.** The concept of social responsibility is important in a number of ways. Women in particular show a "greater willingness to integrate ethical interests in management decision making, revealing a higher degree of social commitment" than do men (Filipe, 2010, p. 293). Consumer social responsibility specifically has been defined as "the moral principles and standards that guide the behaviors of individuals as they *obtain, use, and dispose* of goods and services" (Muncy & Vitell, 1992, cited in Vitell, 2015, p. 768). There are a number of reasons consumers adopt social responsibility, including environmental, human rights, and religious concerns. According to Vitell (2015), "Religious consumers tended to be more willing to pay a higher price for the 'ethical behavior' of a firm" (p. 770).

**Support of Poor People in the Community.** An important feature of Islam is that Muslims are obligated to help the poor Muslim by offering charity. Giving charity/almsgiving is

known as *zakat* in Islam (Ahmed, 1999; Coon, 1966). *Zakat* is a yearly income tax with a specific purpose: to distribute money to ensure quality of life for those Muslims in need (Coon, 1958; Levinson, & Christensen, 2002). *Zakat* has been defined as “a social method of redistributing wealth in the community” (Ahmed, 1999, p. 34) and “to re-distribute wealth to the poorer sections of society” (Ahmed, 2002, p. 17).

Although *zakat* is a religious obligation, Muslims also observe it for cultural reasons, including values of philanthropy and donation. Some wealthy owners of companies in the Middle East have created their own programs to ensure that their philanthropy has a wider impact in their community.

The Abdul Latif Jameel Co. in Jeddah, Saudi Arabia, is cited by Mahajan (2012) as a company with a successful community service program focusing on training blue-collar workers, incubating small businesses, and supporting entrepreneurs. According to Mahajan (2012) “Since the initiative started in 2002, it has trained hundreds of workers for better-paying jobs and helped launch dozens of small businesses. Saudi’s King Abdullah recognized the program with an award in 2007, and government agencies now point to the Jameel programs as an archetype of corporate social responsibility (CSR) in the Saudi private sector” (p. 113). These social programs show a strong connection between the notion of philanthropy and the concept of *zakat* as one of the Islamic pillars that is a form of spiritual purification. A business plan with social enterprise is reflective of increasing interest in ethical production and consumerism, particularly in the area of education for women and the poor. A socially responsible business model was a prime consideration for this study.

### *Fair Trade as a Model of Social Enterprise*

**Social Enterprise.** Spear, Cornforth, and Aiken (2009) define social enterprise as a business model used to achieve a social or environmental purpose more than to achieve profit goals for shareholders or owners. There are different kinds of social enterprises. Spear and colleagues (2009) provide some examples of these enterprises: new start social businesses, trading charities, social green enterprises, and co-operative organizations.

According to White, MacDonnell, and Ellard, (2012), companies and organizations differ in the ethical attributes they can offer to their consumers based on the products or services they provide. The business sector and nongovernmental organizations in some developing countries have moved toward finding solutions to enhance the quality of life of women in poverty (Tutolo, 2011). Thompson (2008) asserts that small business ownership can be a great opportunity for advancement for women in such situations. Designers can be self-employed, which means, with access to a facility with a digital inkjet printer, women can become designers, printers, and manufacturers and start their own small business (Ujiie, 2011). Based on this idea, using the inkjet digital printing method to produce portable prayer rugs is compatible with establishing a new start social business as a sort of social enterprise to help low-income Muslim women improve the quality of their life.

Thus far, no social enterprise has focused on producing portable prayer rugs. A business based on producing portable prayer rugs has potential to be successful in any of the developing Islamic countries to improve quality of life and to increase the number of industrial handcrafted exports, resulting in economic gains.

**Fair Trade Model.** For the purpose of this literature review, small businesses will be included under the term of social enterprise. Fair trade is more commonly associated with small

businesses than large-scale operations. Littrell and Dickson (2010) give a general definition of fair trade: "as opposed to traditional business – it is not only about business success as reflected in sales figures. It is foremost about people and more particularly the ability of disadvantaged producers and workers in the Global context to improve their livelihoods and to make development work to the benefit of their families and communities" (p. 10). They also define fair trade enterprises "as a set of socially responsible practices that include paying a fair wage in the local context, offering equitable employment opportunities among workers, providing healthy and safe working conditions, promoting environmental sustainability, offering business and technical training" (p. 3). In addition, White and colleagues (2012) consider fair trade to be "a social movement that aims to set fair prices for products, alleviate poverty, and assist producers marginalized by traditional economic model" (p. 103).

Building on the previous definitions of fair trade, Littrell and Dickson (2010) point out that the future leaders of this movement will apply fair trade practices directly to their corporate responsibility programs. Social enterprises, as a business model, play an important role in promoting fair trade and encourage consumers to buy fair trade products by providing their consumers with enough information about their organization, mission, product quality, and ethical outcomes (Littrell & Dickson, 2010; Tutolo, 2011). Vitell (2015) notes, "When consumers are informed as to how any perceived injustices can be redressed through fair-trade purchases, this can generate a significant increase in terms of interest in fair-trade purchase" (p. 772).

### **FEA Consumer Needs Model**

The FEA model of consumer needs and wants was created by Lamb and Kallal to "aid in developing design criteria for a variety of consumers" (1992, p. 42). The model is built on

several components: target consumer, culture, and design criteria. Design criteria of the FEA consumer needs model are functional, expressive, and aesthetic (see Figure 2.27). Lamb and Kallal (1992) indicate that each category has specific concerns, which can vary with different users and markets. Functional considerations of a product refer to its utility; expressive considerations of a product refer to the communicative, symbolic aspects of the product; and aesthetic considerations of a product relate to the human desire for beauty (Lamb & Kallal, 1992). The FEA model has been used widely in the textile field, as can be seen in the works of Sindicich (2008), Holland (2007), Cao et al. (2012), Chae and Evenson (2013), Bye (2010), and Stokes & Black (2012).



Figure 2.27 –FEA Consumer Needs Model (Lamb & Kallal, 1992).

### *Applicability of the FEA Consumer Needs Model to This Research*

**Functional.** Functionality in portable prayer rugs encompasses protection, comfort, utility, mobility, and durability. Protection and comfort refer to feelings of safety and physical relief while using products – in this case, meaning prayer rugs adequately protect users from the dirt and roughness of the floor or ground. Many people prefer using prayer rugs that are thick and cushioned to promote comfort. The importance of these characteristics depends on the category of user, for example, based on age, gender, and health.

Utility and mobility in general refer to ease of use (Sutcliffe, 2009). Specifically regarding prayer rugs, the weight of the rug affects its portability. Another aspect of utility in portable prayer rugs is size, or the ability to fold the rug and stow it away – some thick materials make this difficult. The final aspect of functionality is durability. Some cheaply made prayer rugs available on the market last for only a short time. For consumers who use prayer rugs regularly, durability is an important feature. According to Niinimäki and Hassi (2011), studies have shown that the biggest consumer dissatisfaction in the area of textiles is with low quality. The authors suggest that manufacturers offer a longer product life span (meaning a higher quality, and more expensive, product), shifting their focus from exchange value to use value.

**Expressive.** Visual products communicate messages about users to those around them. Social value is extremely relevant in evaluating consumer acceptance of prayer rugs, since the rugs act as visual centerpieces during an integral religious activity in Muslim people's lives. Providing quality, unique prayer rugs for guests and as gifts is an important part of social life in Islamic culture. Luxury and quality reflect social status in Muslim culture, and textiles are particularly important to Muslims in communicating this (Douglas, 2002). The portable prayer rug developed under this research will be designed with aesthetic expressivity in mind.

**Aesthetic.** The aesthetics of the prayer rug refer to the human desire for beauty – something that is pleasing to the eye. Lamb and Kallal (1992) point out, “Items of dress may also be art objects” (p. 43). The aesthetic dimensions of design refer to the use of different elements such as “line, form, color, texture, and pattern to create a pleasing design” (Lamb and Kallal, 1992, p. 43).

Color is a very important element of consideration in prayer rug design. Color can be used to influence users’ moods and mental states. For example, blue and green colors reflect positive emotions and energy (“Area rugs,” 2008). These colors enhance relaxation and facilitate serenity and feelings of peace. Color palettes can be developed to appeal to different categories of prayer rug consumers as well as to adapt to popular trends.

Textile choice is another important consideration. The texture of the material used to produce the product can play an important role in enhancing the positive interaction between the user and the product.

In summary, the purpose of this study was to explore female Muslim consumer preferences related to digitally printed, portable prayer rugs in the context of the FEA consumer needs model. For this study, the researcher created a collection of eight digitally printed portable prayer rugs. Then, the researcher measured the level of interest among Muslim women to purchase digitally printed portable prayer rugs for their functional, expressive, and aesthetic values. Lamb and Kallal’s FEA model was used to organize and interpret the study participants’ responses to the survey questionnaire. In addition, the researcher examined the idea of producing digitally printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women. The concept of socially responsible portable prayer rug production had potential to influence the purchase decisions of socially concerned Muslim consumers.



## CHAPTER 3- METHODOLOGY

This study measured the level of interest among Muslim women in purchasing digitally printed portable prayer rugs for their functional, expressive, and aesthetic values.

Simultaneously, the potential for marketing digitally printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women and its influence on purchase intentions of socially concerned Muslim consumers was examined. The survey used in this study included questions about female Muslim consumers' shopping behaviors regarding prayer rugs, questions regarding the FEA consumer needs model as it related to digitally-printed portable prayer rugs, questions asking potential consumers to evaluate the design elements of the digitally-printed portable prayer rugs, questions analyzing female Muslim consumers' attitudes and purchase intentions, and demographic questions. Rating scales included seven-point Likert scale statements and utilized the seven-point semantic differential scale.

The research questions were as follows:

3. Will Muslim female consumers be interested in purchasing digitally printed portable prayer rugs?
4. Of the three dimensions in the FEA model (functional, expressive, aesthetic), which is the most influential in affecting the purchase behavior of female Muslim consumers?

The objectives of this study were as follows:

1. Design and produce a series of eight digitally printed portable prayer rugs using motifs influenced by Islamic ornamental art to use as examples in this study.
2. Describe the sources of inspiration for portable prayer rug designs.

3. Measure the level of interest among Muslim women to purchase digitally printed portable prayer rugs for their functional, expressive, and aesthetic values.

The activities outlined below were used to accomplish the objectives of the study:

### **Prayer Rug Design and Production**

1. Create eight portable prayer rug designs using Lectra Kaledo Print textile design software.
2. Digitally print the designs on organic cotton sateen fabric and steam the fabrics for dye penetration and stability.
3. Assemble the eight portable prayer rugs with nylon backing fabric and with the storage pouch attached to the right side of the rug.

### **Description of the Sources of Inspiration for Portable Prayer Rug Designs**

The portable prayer rugs developed for this research were designed using a Computer-Aided Design system and a digital printing technique to render traditional Islamic ornaments using contemporary methods.

The eight portable prayer rug designs were created using the CAD system, more specifically Lectra Kaledo Print textile design software. The designs were digitally printed at the Spoonflower company in the USA on organic cotton sateen fabric, and fabrics were steamed for dye penetration and stability. Spoonflower company is one of the entrepreneurial printing businesses that specialized “in printing custom fabric designs for consumers who created them” (Lamar, 2011, p. 354). The eight portable prayer rugs were assembled with a black ripstop nylon backing fabric and with the storage pouch attached to the right side of the rug.

Islamic ornamental art, particularly depiction of the atmosphere of the mosque, was the initial inspiration, accompanied by a variety of motifs and embellishments of Islamic

ornamentation. According to Humbert (1980), “Islamic ornamental art is dynamic, richly colorful, inventive and subtle” (p. 31) (see Figure 3.1). This detailed art provided the researcher with a wide range of motifs to choose from in creating the designs for this study (see Figure 3.2). The designs of these digitally printed portable prayer rugs were divided into three categories: geometric, curvilinear, and *Arabesque*. Geometric and curvilinear designs were described in detail in Chapter 2. Instructions for using the digitally printed portable prayer rugs are available in Appendix G.

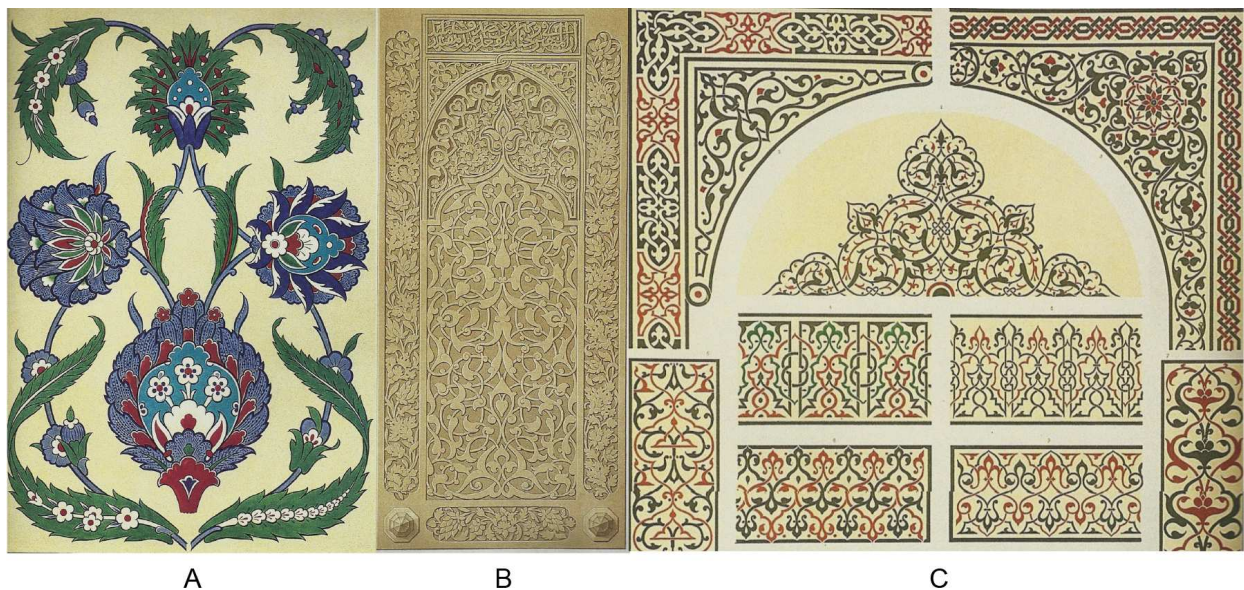


Figure 3.1 – Islamic ornamental art





Figure 3.2 – Collage of Islamic ornamentation with a variety of motifs used as a source of inspiration

## **Sampling and Data Collection Procedure**

This study used a purposeful sampling consisting of 50 international female Muslim consumers at a specified location, The Islamic Center in Fort Collins, a Rocky Mountain regional city in Colorado. The Islamic Center of Fort Collins was selected for data collection in this study for two major reasons. First, the researcher has access to The Islamic Center as a public center for the Muslim community. Second, this specific center has a wide range of attendees who visit frequently to perform Islamic religious activities such as daily prayers and Friday prayer.

The researcher used two approaches to recruiting participants. First, participants were recruited from Fort Collins, CO through flyers (see appendix E). Flyers describing the topic of the survey were placed at two locations; the first location was at the entrance door of INTO Colorado State University and the second location was the entrance door of The Islamic Center of Fort Collins. The flyer stated the topic of the survey “Portable Prayer Rugs” and the purpose of the study. The flyer indicated a statement of appreciation for participating in the study. Incentives were given to the participants of the study in the form of a free \$10 gift card after fully completing the survey and focus group session. Second, a snowball sampling approach used thorough the researchers’ friends.

Data were collected initially during the month of March 2016. Data collection continued until 50 participants had completed the questionnaire. Data collection consisted of two stages. First, we conducted the focus group. The participants were invited to participate in several focus groups; a total of five focus groups were conducted at the Islamic Center of Fort Collins. Each focus group consisted of 6-12 people. During the focus group process, the researcher showed the participants the features of the digitally printed portable prayer rugs and provided hands-on experience for the participants. Then, we conducted the surveys. The focus group session lasted

for about 60 minutes. The survey took approximately 20 minutes to be answered, which was part of the focus group process.

### *Data Collection Procedure*

Eight digitally printed portable prayer rugs were displayed in the presence of the study participants. A survey questionnaire with Likert-style items was administered to measure the main objective of the study, which was: measure the level of interest among Muslim women to purchase digitally printed portable prayer rugs specifically for their functional, expressive, and aesthetic values.

### **Instrument Development**

The questionnaire was developed in the English language and consisted of six sections: demographic information about the participants and their shopping behaviors, questions regarding the FEA consumer needs model, the overall evaluation of the design elements of the proposed digitally printed portable prayer rug designs, consumer attitude, purchase intention, and one open-ended question (see Appendix A).

The questions related to demographic information included age, nationality, marital status, occupation, and income. Below are the questions related to participants' shopping behavior.

1. Do you own a portable prayer rug for yourself? If so, how many?
2. How often do you usually purchase a new prayer rug?
3. How much do you usually spend on a prayer rug?
4. What is the primary reason for you to purchase a new prayer rug?
5. When purchasing a new prayer rug, what is most important to you?
6. How do you usually dispose of your old prayer rugs?

The following questions are related to measuring the level of interest among Muslim women to purchase digitally printed portable prayer rugs for their functional, expressive, and aesthetic values. These items are measured on a seven-point Likert scale from 1=strongly disagree to 7=strongly agree.

*Functional value:*

1. Using this prayer rug would be comfortable.
2. Using this prayer rug would be helpful; the weight of this prayer rug would be easy to carry.
3. The thickness of this prayer rug would give me enough protection from scratching myself on the floor.
4. The length and width of the portable prayer rug would be sufficient to kneel on.
5. The folded size of the portable prayer rug would fit in my purse or backpack.
6. The attached foldable case for the portable prayer rug would be useful.

Functional value questions were designed to measure the aspects of the digitally printed portable prayer rugs such as comfort, portability, protection, and ease of use.

*Expressive value:*

1. The incorporation of the *Kabah* in the design of the portable prayer rug would influence my purchase decision.
2. This portable prayer rug would be more compatible with my needs than the portable prayer rug(s) I already have.
3. This portable prayer rug would be appropriate for my lifestyle.
4. The use of motifs that depict the *mihrab* in the portable prayer rug represent the atmosphere of the mosque.

These specific questions were designed to measure the expressive aspects of the digitally printed portable prayer rugs. Although the fourth question was not part of the expressive section, it was analyzed under this value because the symbol of the *mihrab* is an expression of the user's connection to Islam, an important value for Muslims.

*Aesthetic value:*

1. The appearance of the portable prayer rug is aesthetically appealing to me.
2. The color of the portable prayer rug matches my favorite color(s).
3. The use of Islamic ornamentations to decorate/embellish the surface of portable prayer rugs is aesthetically appealing to me.
4. The color schemes are aesthetically appropriate for a prayer rug.

These questions were designed to measure the aesthetic appeal of the digitally printed portable prayer rugs based on general appearance, color schemes, and ornaments. Overall, the questions related to the broad evaluation of the digitally-printed portable prayer rug designs, more specifically, the evaluation of each one of the eight prayer rugs designs for: a) color, b) level of complexity of the design, and c) drawing (design of Islamic ornamentations). These items were rated on a seven-point Likert scale from 1=least preferred to 7=most preferred.

The question used to judge participants' attitudes and interest toward purchasing digitally-printed portable prayer rugs was, "To me, purchasing a digitally printed portable prayer rug is..." Answers were measured on seven-point semantic differential scale from 1=bad to 7=good, 1=unfavorable to 7=favorable, and 1=foolish to 7=wise.

The following questions were designed to measure female Muslim consumers' purchase intentions toward digitally printed portable prayer rugs.

1. I intend to try this type of prayer rug.



2. It is likely that I will buy this prayer rug when it becomes available.
3. I would purchase this prayer rug.
4. This prayer rug as an ethical and socially responsible product would influence my purchase decision.
5. This prayer rug as an environmentally friendly product would influence my purchase decision.
6. If I knew that the money from purchasing this prayer rug went to low-income women who made the rug that would influence my purchase decision.

An open-ended question, “Are there any additional thoughts and comments about the portable prayer rug that you would like to share with us,” was designed to elicit descriptive information that added meaning to the results of the quantitative analysis.

### **Data Analysis**

Descriptive analysis used to analyze the demographic information on study participants. A quantitative approach was implemented in this study in terms of data collection process. The data collected from the survey was analyzed using regression analysis to answer the research questions in SPSS, which are: 1- Will female Muslim consumers be interested in purchasing digitally printed portable prayer rugs? and 2- Of the three dimensions of the FEA model (functional, expressive, aesthetic), which is the most influential in affecting the purchase behavior of female Muslim consumers?

The effect of the functional, expressive, aesthetic on the attitude was tested using two-way ANOVA analysis. The descriptive analysis was used to study the consumer preference for the eight digitally-printed portable prayer rug designs.

## CHAPTER- 4 RESULTS

The purpose of this study was to explore female Muslim consumer preferences related to digitally printed portable prayer rugs in the context of the FEA consumer needs model. For this study, the researcher designed and produced a series of eight digitally printed portable prayer rugs using motifs influenced by Islamic ornamental art to use as examples in this study. Then, the researcher described the sources of inspiration for portable prayer rug designs. Later, the researcher measured the level of interest among Muslim women to purchase digitally printed portable prayer rugs for their functional, expressive, and aesthetic values through a survey approach. Also, The researcher intended to examine the idea of producing digitally printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women, simultaneously influencing the purchase decisions of socially concerned Muslim consumers. The results of conducting this study were used to answer the following research questions:

1. Will Muslim female consumers be interested in purchasing digitally printed portable prayer rugs?
2. Of the three dimensions in the FEA model (functional, expressive, aesthetic), which is the most influential in affecting the purchase behavior of Muslim female consumers?

This chapter is divided into two parts. The first part describes the actual portable prayer rug designed and produced for this research. CAD illustrations and finished photographs of each rug are included in this section to help clarify the consumer behavior data collected for each rug design.

The portable prayer rug developed under this research was made with two layers of high quality material (digitally printed organic cotton sateen fabric and ripstop Nylon backing fabric) to add thickness to the rug, giving users adequate protection from rough surfaces while still being lightweight and easy to carry. The size of the digitally printed portable prayer rug, including both width and length, has been increased compared with currently available products and was evaluated by the participants in this study as a way to solve a perceived size issue with currently available rugs.

The size of the developed portable prayer rug is 3.7 ft. x 2.3 ft., while the size of currently available prayer rugs is 3.2 ft. x 1.7 ft. The digitally printed portable prayer rug can still be folded to fit in a backpack, which has been demonstrated by study participants. The researcher's digitally printed portable prayer rug addresses functionality by including a backing fabric and storage pouch attached to the right side of the rug instead of having a separate pouch to store the rug that may be misplaced.

There is a lack of prayer rugs currently for sale that depict the atmosphere of the Mosque, the traditional location of prayer in Islam. Because modern lifestyles do not always allow for prayer to be performed in a Mosque, representing some of the Mosque's features by incorporating them into the design of prayer rugs has been met with appreciation by Muslim consumers, and is seen as an added expressive value.

In response to the lack of rugs on the market depicting the atmosphere of the Mosque, the researcher's digitally printed portable prayer rug designs depict the prayer-niche "mihrab." The mihrab is defined as "a linear representation of a prayer niche, which appears in a number of forms on prayer rugs. The mihrab is present in all Mosques and indicates the direction of Mecca, which all faithful face when they pray" (Bamborough, 1989, p. 44). Hence, the digitally printed

portable prayer rug offers a means for women to embrace traditional daily prayers in a modern world where being in the home is not the norm.

Due to the lack of aesthetically appealing traditional designs in currently available pocket-sized portable prayer rug, the researcher of this study presented traditional designs in layouts reminiscent of oriental prayer rugs. Additionally, when the digitally printed portable prayer rug is folded, it resembles a fashionable wallet, lending aesthetic value even when not in use. The following figures from Figure 4.1 to Figure 4.42 portray the eight prayer rug designs, including three views.

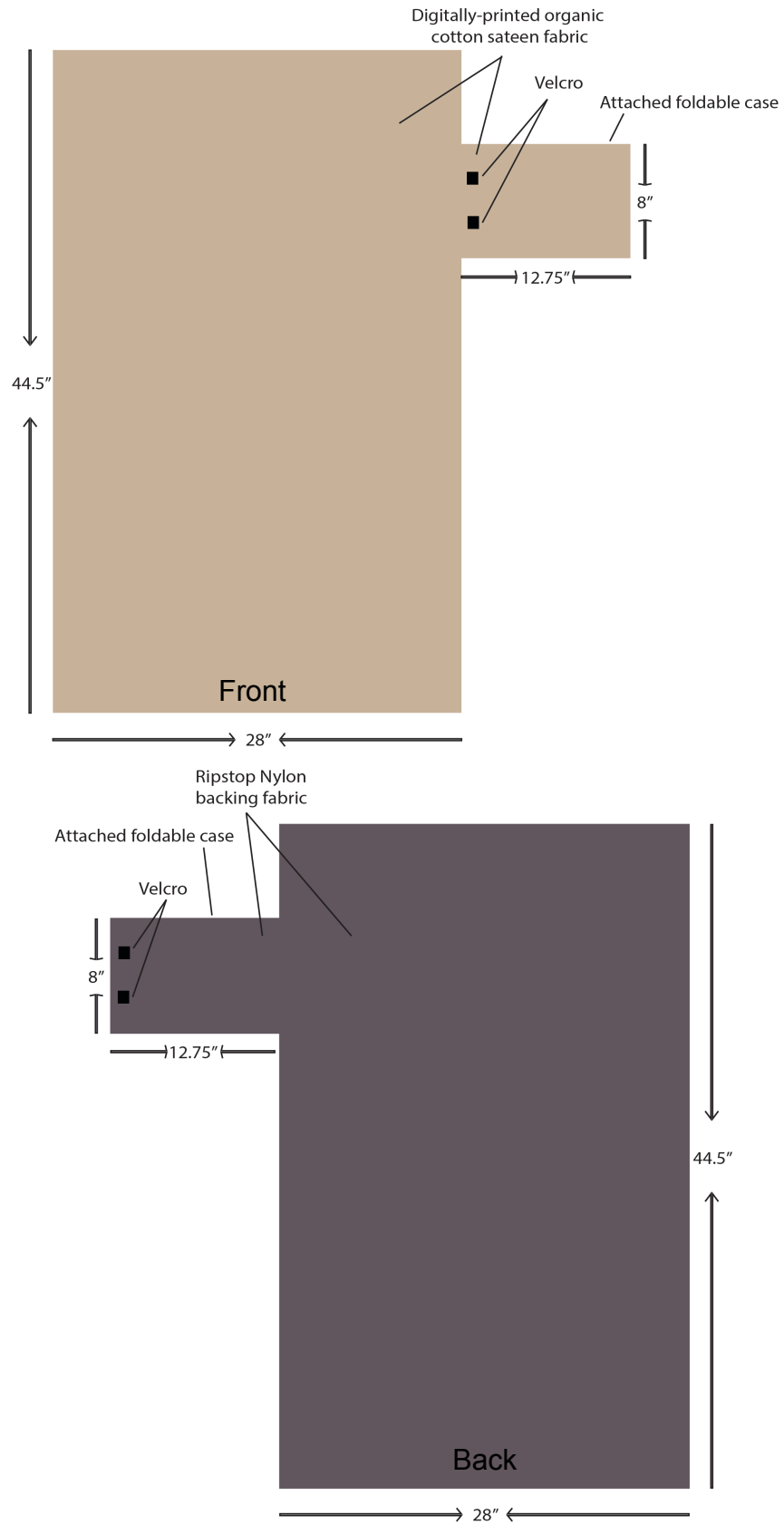


Figure 4.1 – Illustration drawing of the digitally-printed portable prayer rug.



An open view of the digitally-printed portable prayer rug



A folded view of the digitally-printed portable prayer rug

1- A produced sample of the digitally-printed portable prayer rug



Separate carrying case

A folded view of the pocket-sized portable prayer mat



2- The current pocket-sized portable prayer mat

Figure 4.2 – Comparative views between the current pocket-sized portable prayer rug and a produced sample of the digitally-printed portable prayer rug



Figure 4.3 – CAD drawing of the digitally-printed portable prayer rug, Design #1



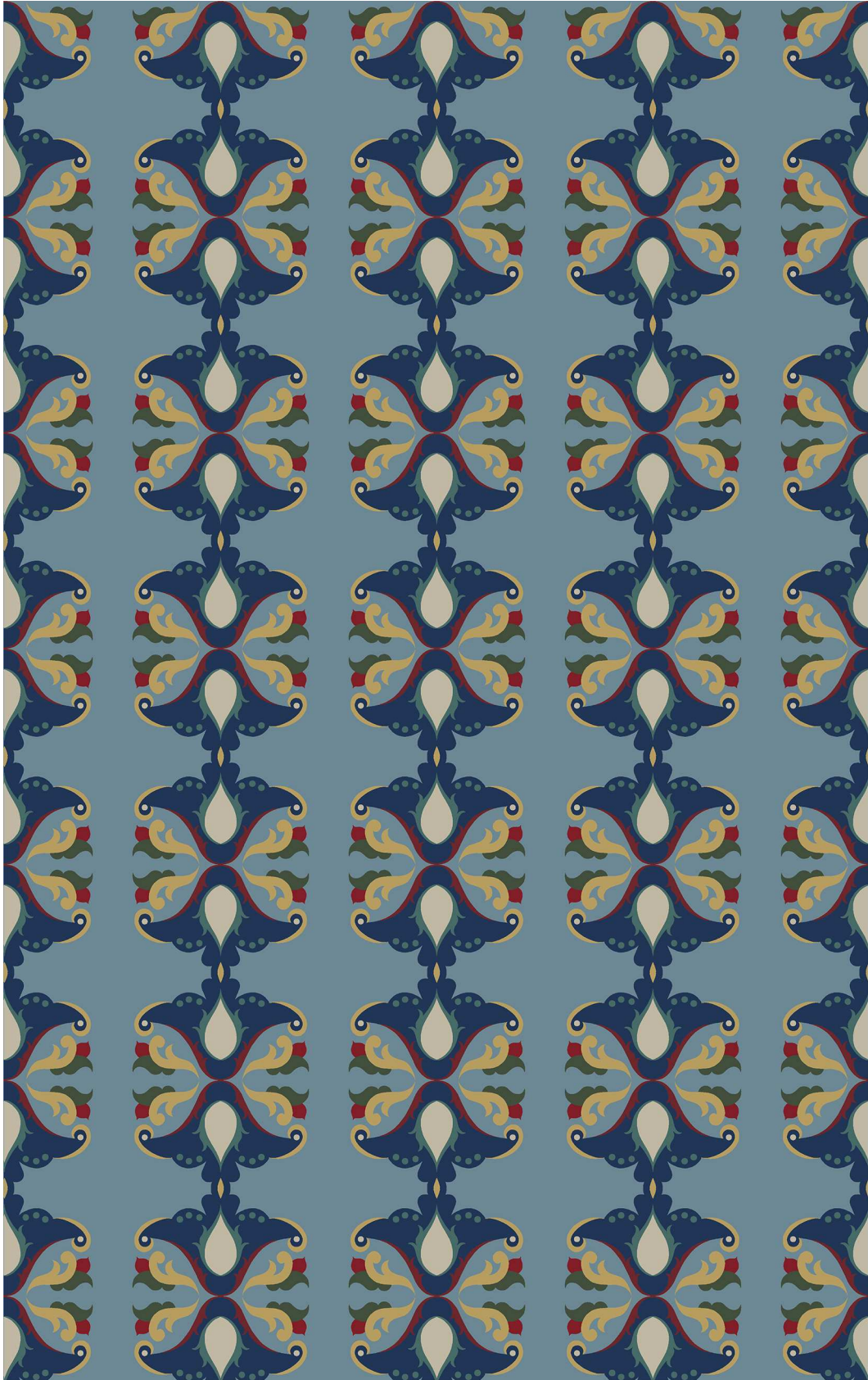


Figure 4.4 – Coordinating repeat textile design #1





Figure 4.5 – A photograph of the digitally-printed portable prayer rug, Design #1  
(An overall view)



Figure 4.6 – A photograph of the digitally-printed portable prayer rug, Design #1  
(1<sup>st</sup> Detailed views)



Figure 4.7 – A photograph of the digitally-printed portable prayer rug, Design #1  
(2<sup>nd</sup> Detailed views)



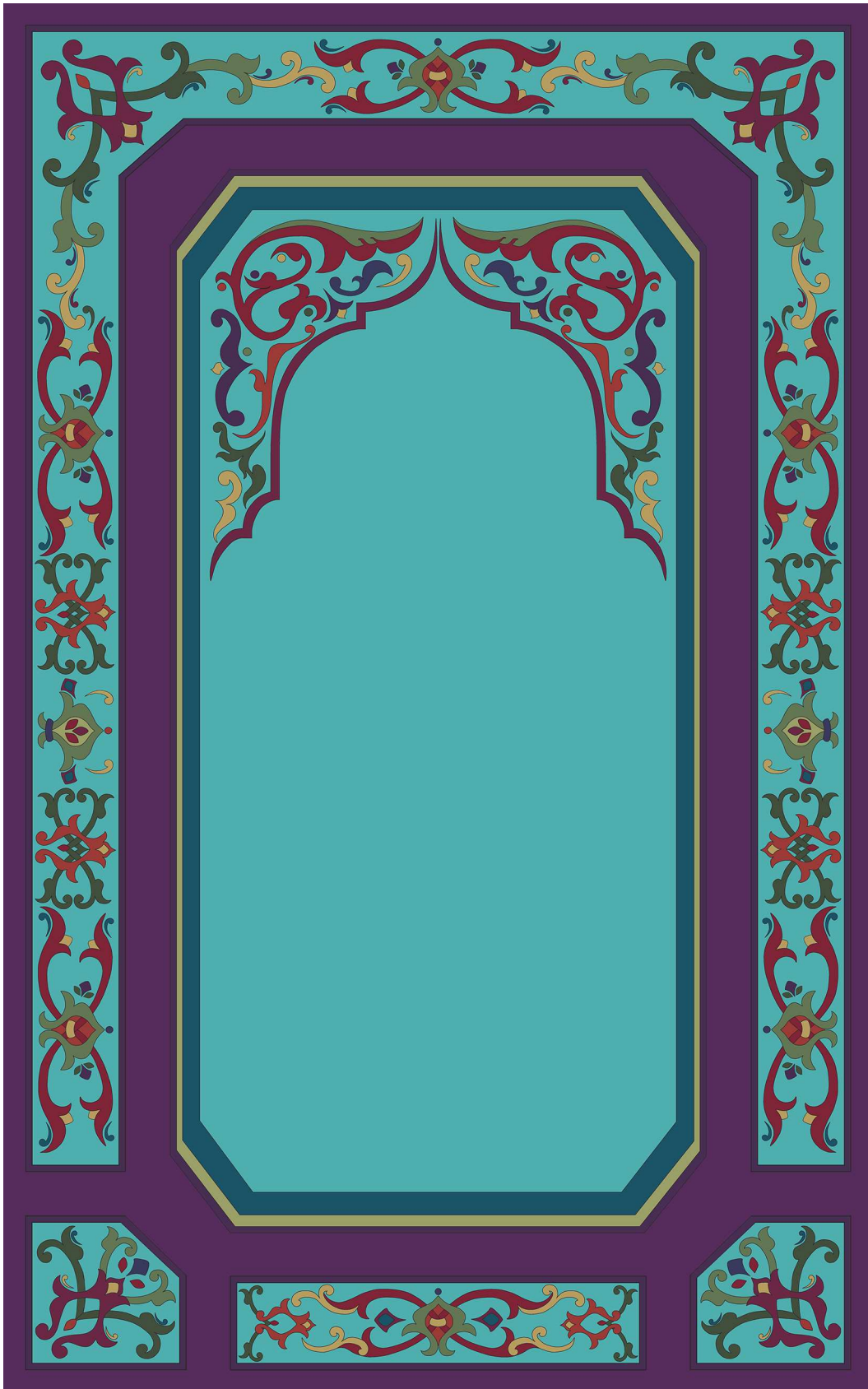


Figure 4.8 – CAD drawing of the digitally-printed portable prayer rug, Design #2

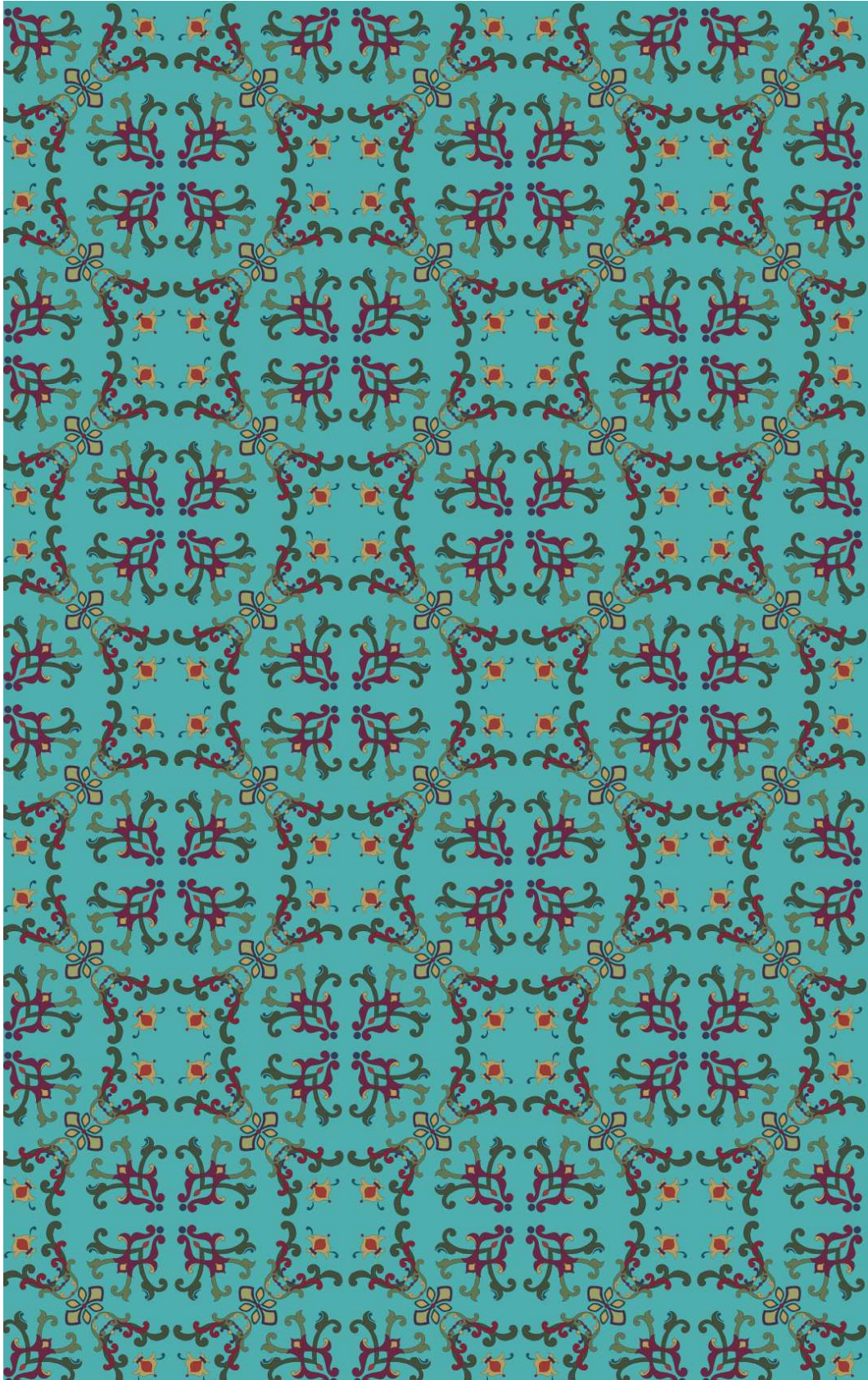


Figure 4.9 – Coordinating repeat textile design #2





Figure 4.10 – A photograph of the digitally-printed portable prayer rug, Design #2  
(An overall view)



Figure 4.11 – A photograph of the digitally-printed portable prayer rug, Design #2  
(1<sup>st</sup> Detailed views)



Attached  
foldable  
case

Figure 4.12 – A photograph of the digitally-printed portable prayer rug, Design #2  
(2<sup>nd</sup> Detailed views)





Figure 4.13 – CAD drawing of the digitally-printed portable prayer rug, Design #3



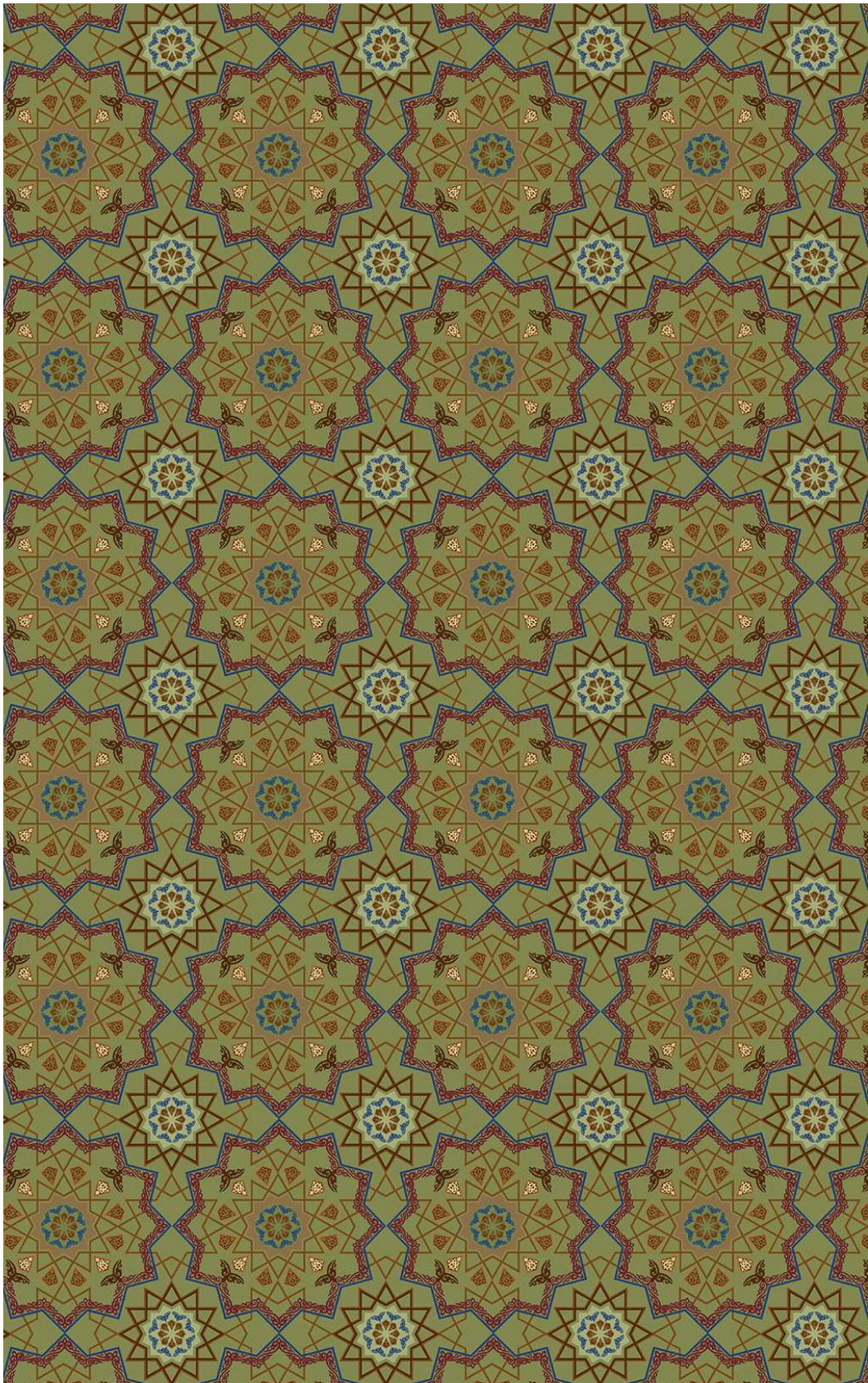


Figure 4.14 – Coordinating repeat textile design #3



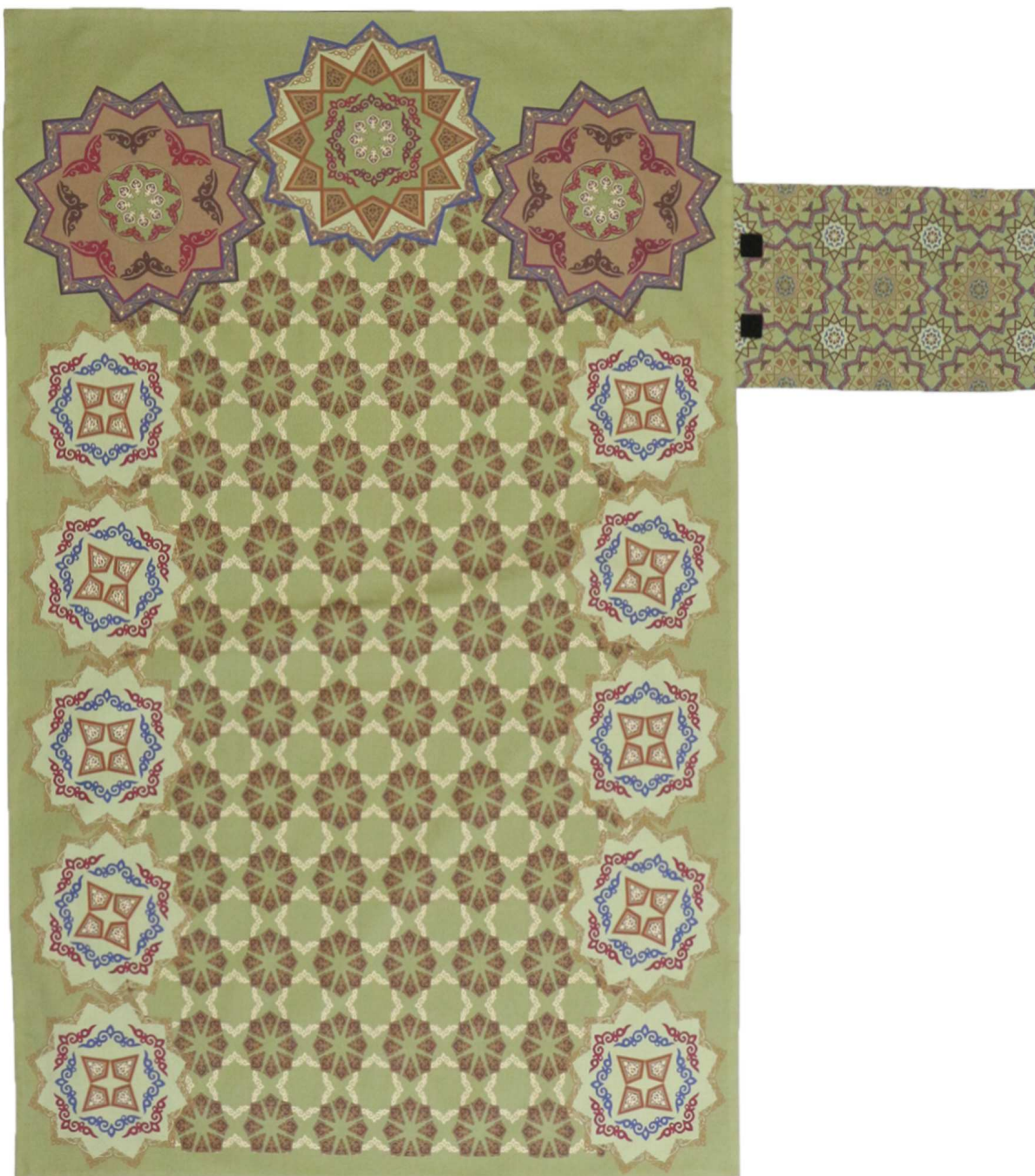
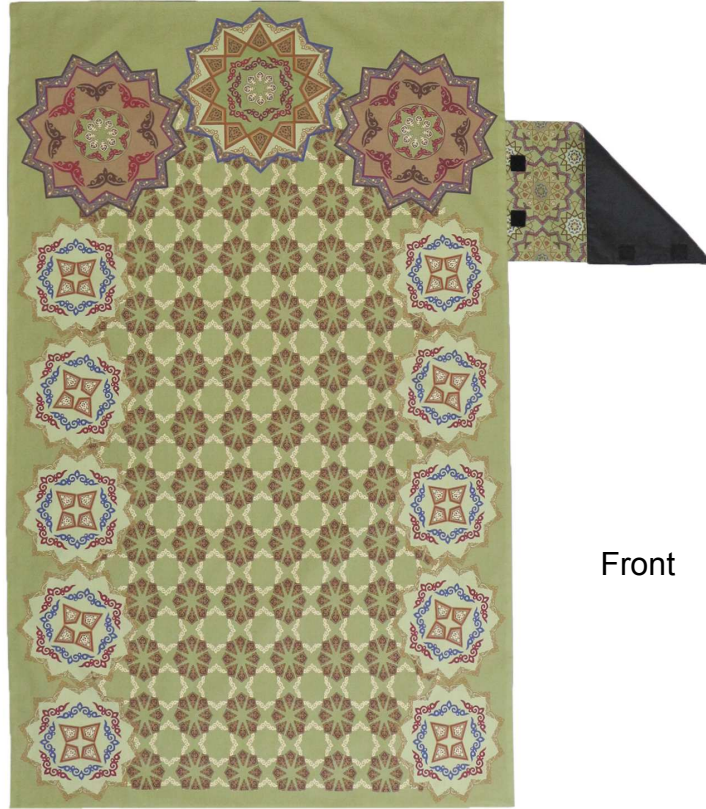


Figure 4.15 – A photograph of the digitally-printed portable prayer rug, Design #3  
(An overall view)



Front



Back

Figure 4.16 – A photograph of the digitally-printed portable prayer rug, Design #3  
(1<sup>st</sup> Detailed views)





Figure 4.17 – A photograph of the digitally-printed portable prayer rug, Design #3  
(2<sup>nd</sup> Detailed views)

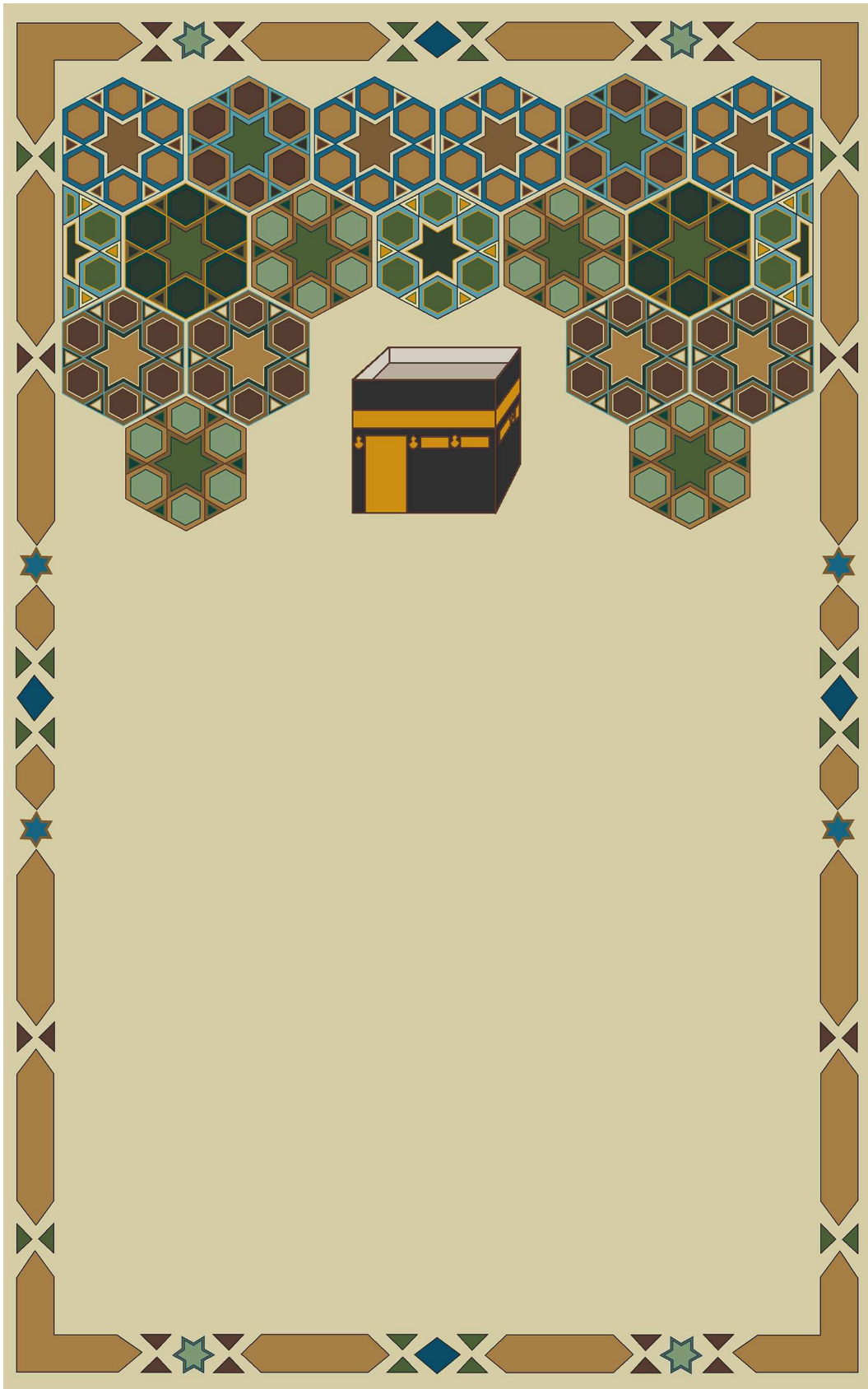


Figure 4.18 – CAD drawing of the digitally-printed portable prayer rug, Design #4



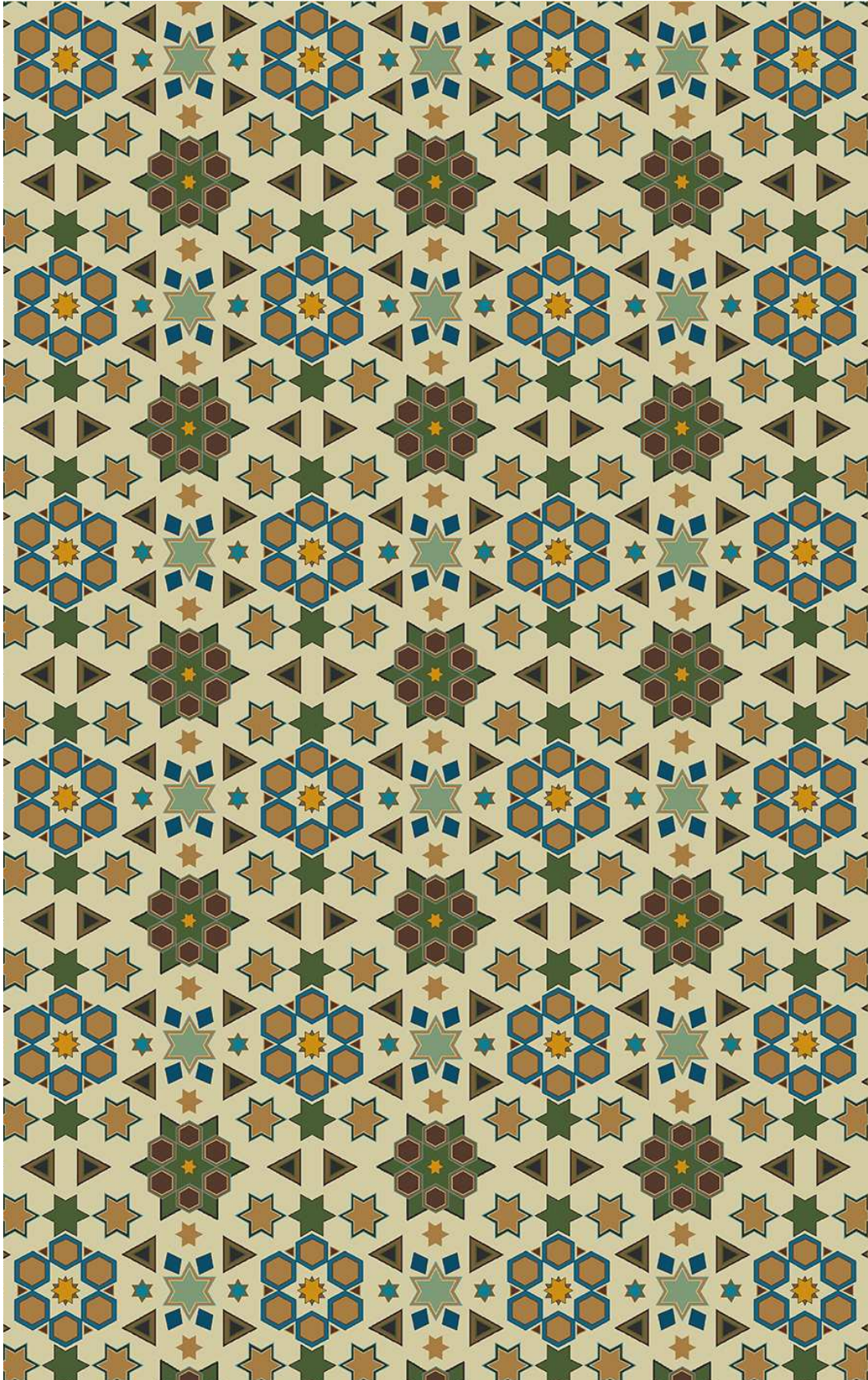


Figure 4.19 – Coordinating repeat textile design #4



Figure 4.20 – A photograph of the digitally-printed portable prayer rug, Design #4  
(An overall view)





Figure 4.21 – A photograph of the digitally-printed portable prayer rug, Design #4  
(1<sup>st</sup> Detailed views)



Figure 4.22 – A photograph of the digitally-printed portable prayer rug, Design #4  
(2<sup>nd</sup> Detailed views)

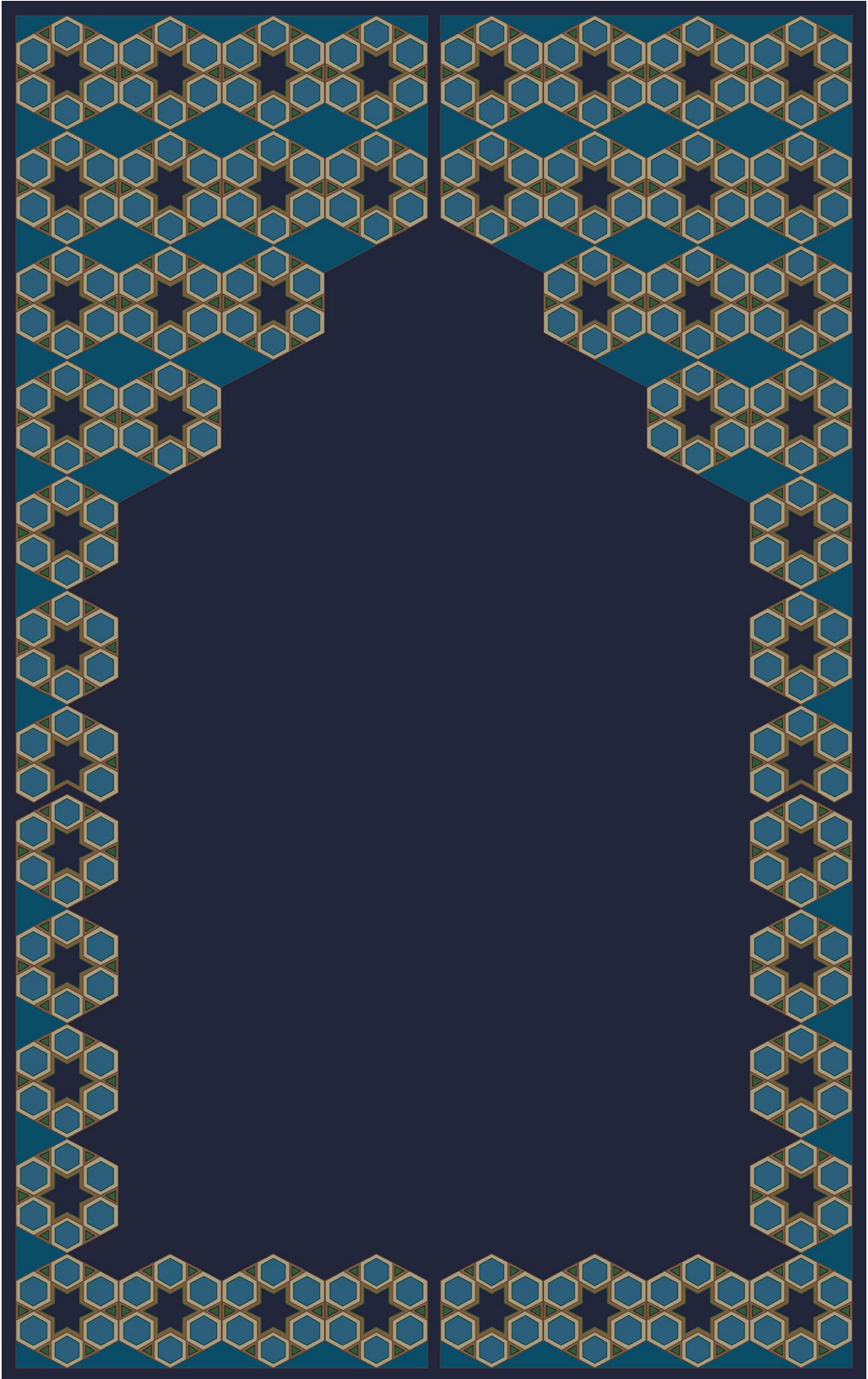


Figure 4.23 – CAD drawing of the digitally-printed portable prayer rug, Design #5



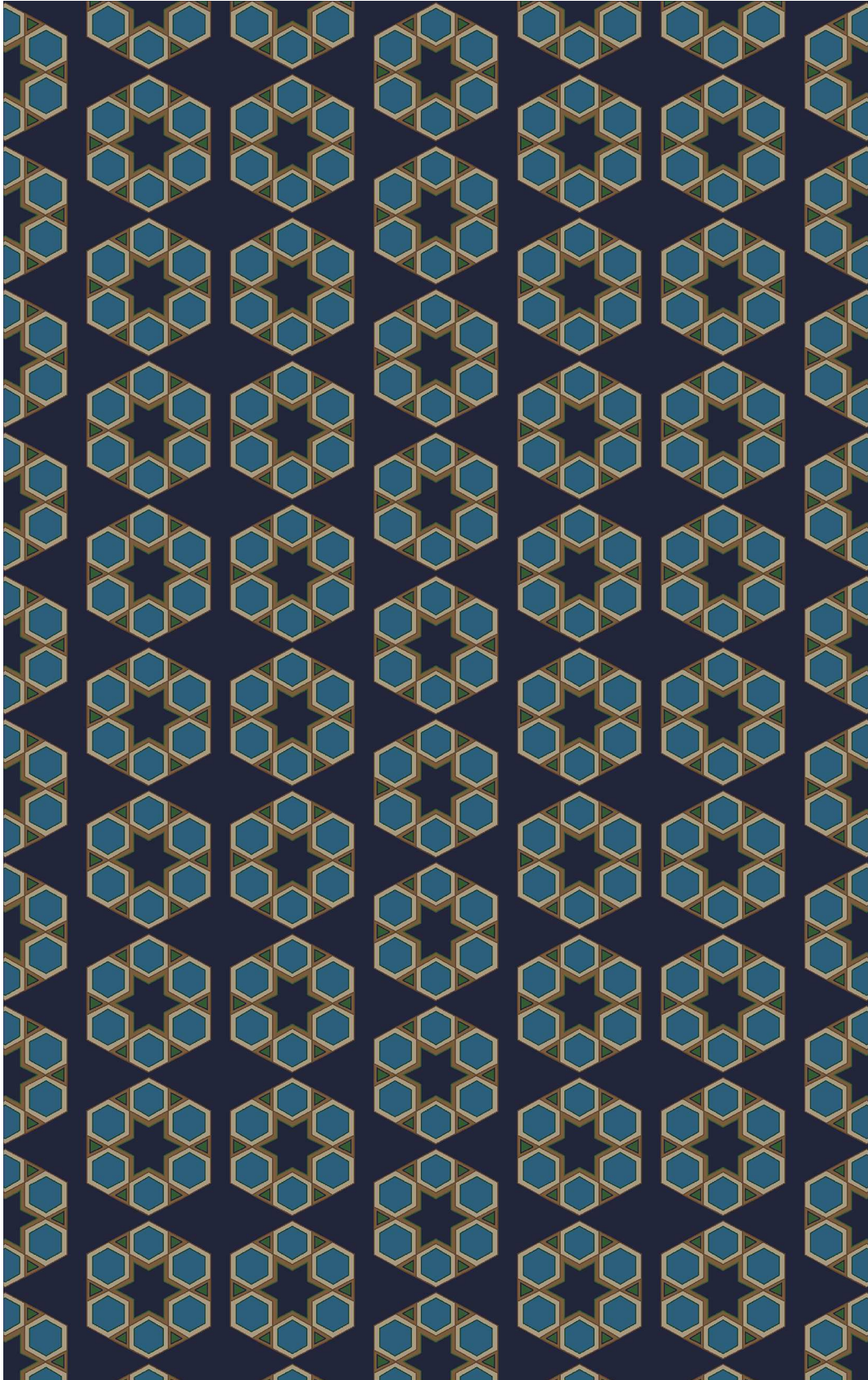


Figure 4.24 – Coordinating repeat textile design #5



Figure 4.25 – A photograph of the digitally-printed portable prayer rug, Design #5  
(An overall view)





Figure 4.26 – A photograph of the digitally-printed portable prayer rug, Design #5  
(1<sup>st</sup> Detailed views)



Figure 4.27 – A photograph of the digitally-printed portable prayer rug, Design #5  
(2<sup>nd</sup> Detailed views)

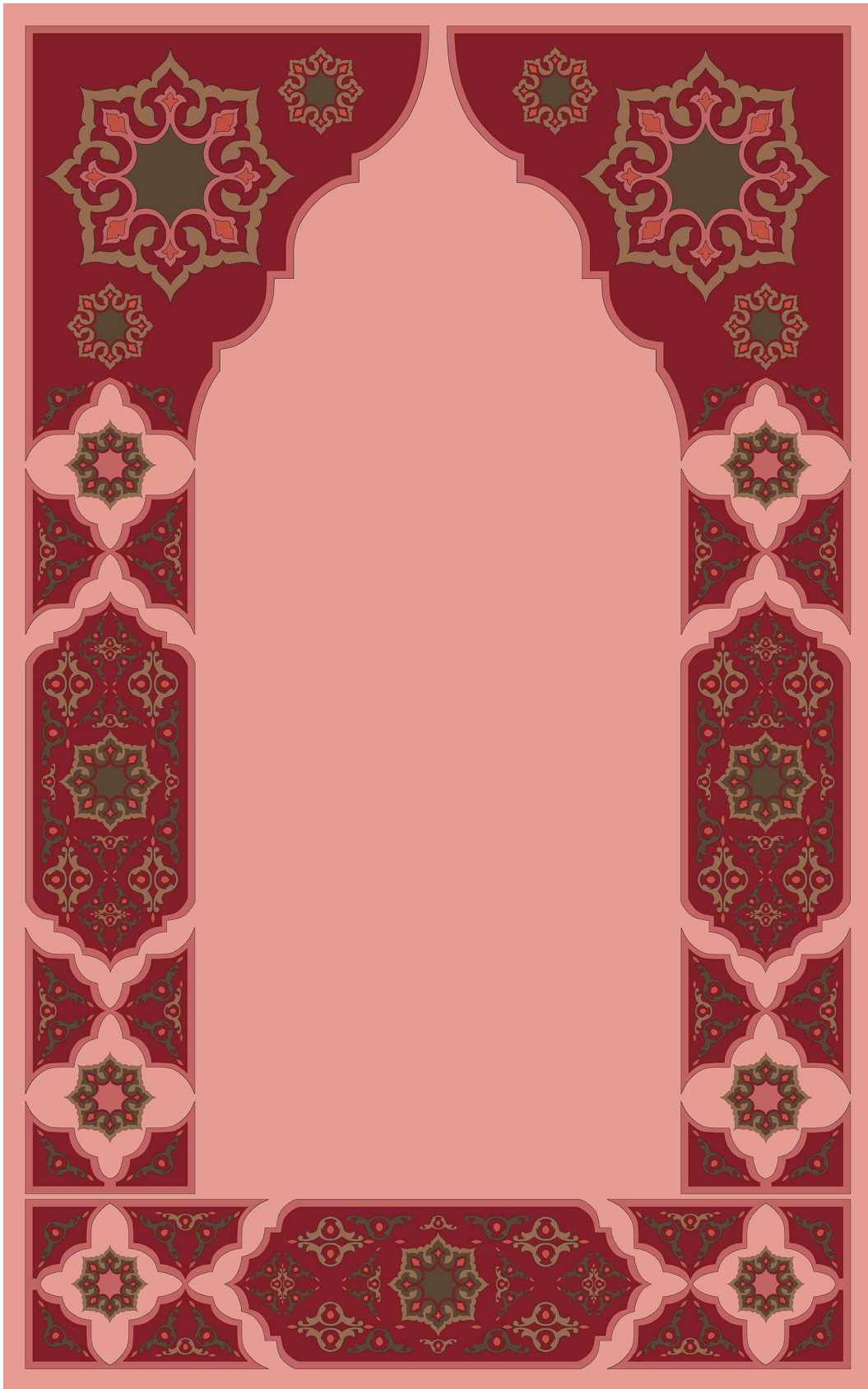


Figure 4.28 – CAD drawing of the digitally-printed portable prayer rug, Design #6



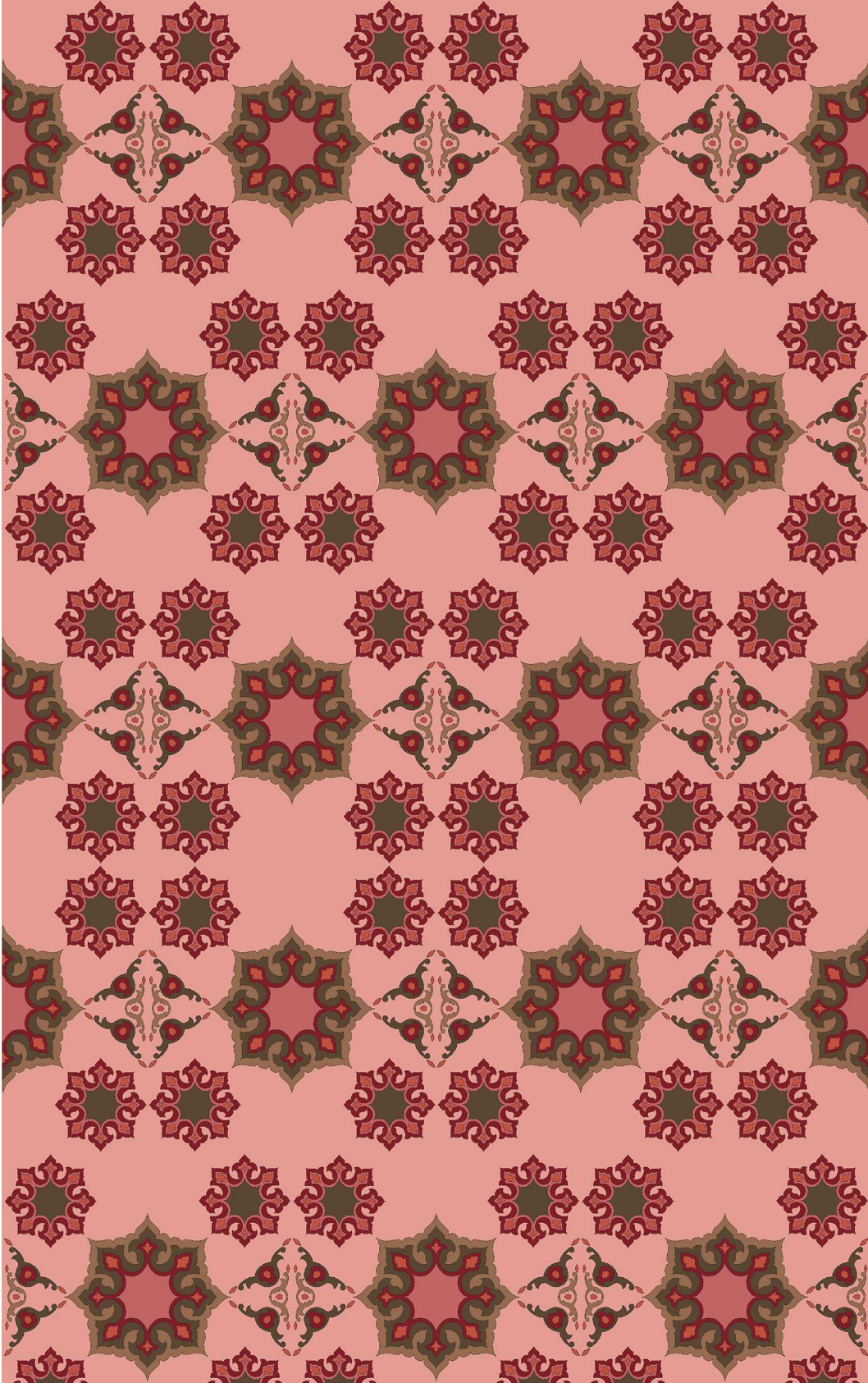


Figure 4.29 – Coordinating repeat textile design #6



Figure 4.30 – A photograph of the digitally-printed portable prayer rug, Design #6  
(An overall view)





Figure 4.31 – A photograph of the digitally-printed portable prayer rug, Design #6  
(1<sup>st</sup> Detailed views)



Figure 4.32 – A photograph of the digitally-printed portable prayer rug, Design #6  
(2<sup>nd</sup> Detailed views)



Figure 4.33 – CAD drawing of the digitally-printed portable prayer rug, Design #7



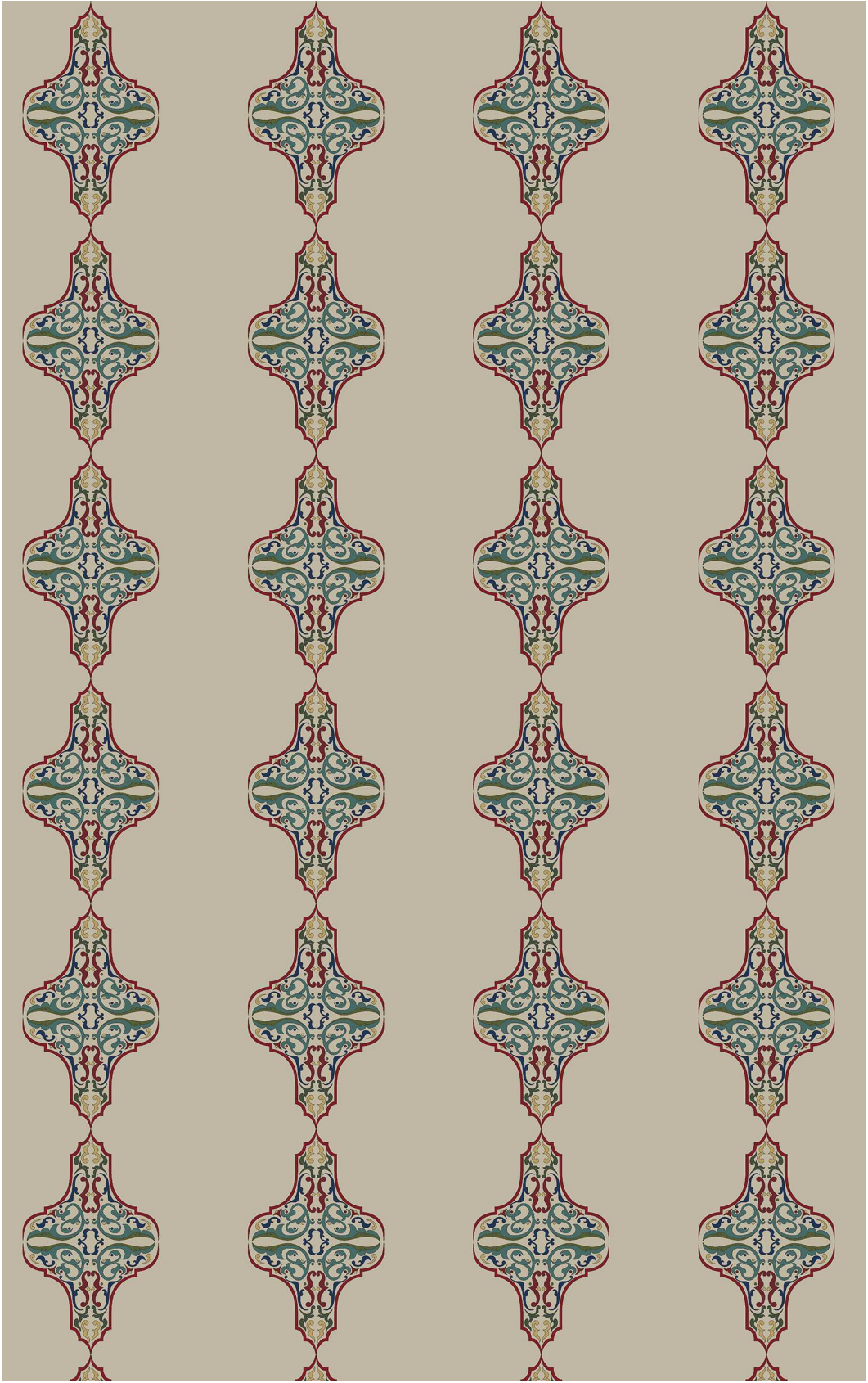


Figure 4.34 – Coordinating repeat textile design #7



Figure 4.35 – A photograph of the digitally-printed portable prayer rug, Design #7  
(An overall view)



Front



Back

Figure 4.36 – A photograph of the digitally-printed portable prayer rug, Design #7  
(1<sup>st</sup> Detailed views)





Figure 4.37 – A photograph of the digitally-printed portable prayer rug, Design #7  
(2<sup>nd</sup> Detailed views)



Figure 4.38 – CAD drawing of the digitally-printed portable prayer rug, Design #8





Figure 4.39 – Coordinating repeat textile design #8



Figure 4.40 – A photograph of the digitally-printed portable prayer rug, Design #8  
(An overall view)





Front

Back

Figure 4.41 – A photograph of the digitally-printed portable prayer rug, Design #8  
(1<sup>st</sup> Detailed views)



Figure 4.42 – A photograph of the digitally-printed portable prayer rug, Design #8  
(2<sup>nd</sup> Detailed views)

Five focus groups were conducted at The Islamic Center of Fort Collins, Colorado, during the first and second weeks of March 2016. As necessary, more data were collected during the third and fourth weeks of March 2016. Each focus group consisted of 6-12 people. The survey was given to the participants after the researcher showed the participants the features of the digitally-printed portable prayer rugs and provided hands on experience for the participants. The focus group lasted for an hour. The survey took approximately 20 minutes, which was part of the focus group process.

### **Descriptive of Participants**

The data were gathered by surveying female Muslim consumers who used prayer rugs and frequently attended The Islamic Center of Fort Collins, Colorado. A total of 50 surveys were completed and included for data analyses.

The mean age of the participants was 35 years old (SD=13.06). Age of participants ranged from 18 to 82. With regards to nationality, 38% of the participants were from Libya (n=19), 24% from Saudi Arabia (n=12), 14% from America (n=7), 14% from Egypt (n=7), 4% from Bangladesh (n=2), 2% from Oman (n=1), and 2% from Syria (n=2). About 38% of the participants were married with kids, 30% married, 28% single, and 4% divorced. Descriptive statistics for the first section of demographic data collected from the consumer survey of portable prayer rug use are shown below in Table 4.1.



**Table 4.1- Demographic Characteristics of the Participants (N=50)**

<b>Characteristics</b>	<b>(n)</b>	<b>Sample Percentage (%)</b>
<b>Age</b>		
Mean	35	
Range	18-82	
<b>Nationality</b>		
American	7	14.0
Bengali	2	4.0
Egyptian	7	14.0
Libyan	19	38.0
Omanian	1	2.0
Saudi Arabian	12	24.0
Syrian	1	2.0
Missing	1	2.0
<b>Martial</b>		
Single	14	28.0
Married	15	30.0
Married with kids	19	38.0
Divorced	2	4.0

The majority of participants were students at 44% (n=22), 36% homemakers (n=18), 12% full-time employed (n=6), and 6% part-time employed (n=3). There were five levels of monthly household income in the survey. Among the participants, 24% of them earned a monthly household income below \$1,000 (level 1), 16% of the respondents reported a monthly household income between \$1,001 to \$1,500 (level 2), 24% of the respondents reported a monthly household income between \$1,501 to \$2,000 (level 3), 12% of the respondents reported a monthly household income between \$2,001 to \$2,500 (level 4), and 24% of the respondents reported a monthly household income more than \$2,500 (level 5). Descriptive statistics for the second section of demographic data collected from the consumer survey of portable prayer rug use are shown below in Table 4.2.

**Table 4.2- Demographic Characteristics of the Participants (N=50)**

<b>Characteristics</b>	<b>(n)</b>	<b>Sample Percentage (%)</b>
<b>Occupation</b>		
Part time employed	3	6.0
Full time employed	6	12.0
Student	22	44.0
Homemaker	18	36.0
Missing	1	2.0
<b>Monthly household income</b>		
Below \$1,000	12	24.0
\$1,001 to \$1,500	8	16.0
\$1,501 to \$2,000	12	24.0
2,001 to \$2,500	6	12.0
More than \$2,500	12	24.0

**Shopping behavior**

The respondents' shopping behavior and usage behavior of prayer rugs were recorded through multiple choice questioning, displayed in several tables below. The results of respondents' answers to the question of "In general, do you own a portable prayer rug for yourself? If so, how many?" were reported in Table 4.3.1. Over 70% of the respondents (n=36) had one or more portable prayer rugs for themselves, while 28% of respondents (n=14) had none.

**Table 4.3.1- Owning a Portable Prayer Rug for Yourself? If so, How Many? (N=50)**

<b>Shopping behavior and usage behavior of prayer rugs</b>	<b>(n)</b>	<b>(%)</b>
<b>How many portable prayer rugs?</b>		
None	14	28.0
1	13	26.0
2-3	13	26.0
4-5	8	16.0
More than 5	2	4.0

The results of respondents' answers to the following questions: "How often do you usually purchase a new prayer rug?" are summarized in Table 4.3.2. Results showed that 34% (n=17) of the respondents usually purchased a new prayer rug once several years, 18% (n=9)

several times a year, and 12% (n= 6) once a year, while 36% (n= 18) rarely purchased a new prayer rug. On average, the respondents reported that they spent \$22 on buying a prayer rug.

**Table 4.3.2- Purchasing a New Prayer Rug and How Much do You Usually Spend on Buying a Prayer Rug (N=50)**

<b>Shopping behavior and usage behavior of prayer rugs</b>	<b>(n)</b>	<b>(%)</b>
<b>How often do you usually purchase a new prayer rug?</b>		
Rarely	18	36.0
Once several years	17	34.0
Once a year	6	12.0
Several times a year	9	18.0
Once a month	0	0.0
<b>How much do you usually spend on buying a prayer rug?</b>		
Mean	22	

Results showed that the top reason for the respondents to purchase a new prayer rug was for themselves (72%, n=36), followed by for gifts (50%, n=25), and for guests (46%, n=23). See Table 4.3.3 for details.

**Table 4.3.3- The Primary Reason for You to Purchase a New Prayer Rug (N=50)**

<b>Shopping behavior and usage behavior of prayer rugs</b>	<b>(n)</b>	<b>(%)</b>
<b>The primary reason for you to purchase a new prayer rug is</b>		
For gifts	25	50.0
For guests	23	46.0
For myself	36	72.0
Other	2	4.0

Note:

Participants were allowed to check all answers that apply, therefore, numbers may add up to more than 50.

The results of respondents' answers to the question of "When purchasing a new prayer rug, what is most important to you?" are displayed below in Table 4.3.4. The majority of respondents reported that the most important feature to them when they purchased a new prayer

rug was quality (82%, n= 41), design (e.g., colors, motifs) (62%, n=31), price (42%, n=21), thickness of the rug (36%, n=13), and portability (26%, n=13). Participants also reported other features to consider when purchasing a new prayer rug, which included comfortable (n=2), softness (n=1), and doesn't distract from prayer (n=1).

**Table 4.3.4- The Most Important to You When Purchasing a New Prayer Rug (N=50)**

<b>Shopping behavior and usage behavior of prayer rugs</b>	<b>(n)</b>	<b>(%)</b>
<b>When purchasing a new prayer rug, what is most important to you?</b>		
Design (e.g., colors, motifs)	31	62.0
Portability	13	26.0
Price	21	42.0
Quality	41	82.0
Thickness of the rug	18	36.0
Other	4	8.0

Note:

Participants were allowed to check all answers that apply, therefore, numbers may add up to more than 50.

Respondents were asked how they usually disposed of their old prayer rugs. Results in Table 4.3.5 showed that most of the participants donated their old prayer rugs (50%, n=25), 22% of the participants put their old prayer rugs aside in storage, 18% of the participants reused their old prayer rugs for other purpose, 18% of the participants give their old prayer rugs to family/friends, 8% of the participants recycled their old prayer rugs, and only 2% of the participants tossed their old prayer rugs.

**Table 4.3.5- Disposal the Old Prayer Rugs (N=50)**

<b>Shopping behavior and usage behavior of prayer rugs</b>	<b>(n)</b>	<b>(%)</b>
<b>How do you usually dispose of your old prayer rugs?</b>		
Donate it	25	50
Toss it	1	2.0
Recycle it	4	8.0
Reuse it for other purpose	9	18.0
Put it aside in storage	11	22.0
Give it to family/friends	9	18.0
Other	5	10.0

Note:

Participants were allowed to check all answers that apply, therefore, numbers may add up to more than 50.

### **Measurements the Design Criteria of the FEA Consumer Needs Model**

Female Muslim consumer preferences of digitally-printed portable prayer rugs designed for this project were measured based on the FEA consumer needs model including: functional, expressive and aesthetic values. The following sections document the results.

#### *Functional Value*

Functional value was recorded based on participants' perception about digitally-printed portable prayer rugs. Seven questions on a 7-point Likert type scale ranging from Strongly Disagree (1) to Strongly Agree (7) were asked in the survey. The results are recorded in several tables below.

The percentages of responses indicate that respondents strongly agreed with the item "Using this prayer rug would be comfortable" (n=36, 72.0%) (M=6.36). Respondents were also more likely to agree with the item "Using this prayer rug would be helpful" (n=47, 94.0%) (M=6.50). Respondents strongly agreed with the item "The weight of this prayer rug would be easy to carry" (n=35, 70.0%) with a higher mean score (M=6.60) compared to the other items



that were used to measure the functional value. Respondents were more likely to agree with the item “The thickness of this prayer rug would give me enough protection from scratching myself on the floor” (n=46, 92.0%) (M=6.18).

The percentages of responses indicated that respondents strongly agreed with the item “The length and width of the portable prayer rug would be sufficient to kneel on” (n=36, 72.0%) (M=6.59) and “The folded size of the portable prayer rug would fit in my purse or backpack” (n=35, 70.0%) (M=6.48).

Finally, among the seven items that were used to measure the functional value of the digitally printed portable prayer rug, the results showed a significant percentage of likely agreement about the statement of “The attached foldable case of the portable prayer rug would be useful” (n=50, 100.0%) (M=6.52). Results are shown in Table 4.4 below.

**Table 4.4- Respondents' Perceived Functional Value of Digitally-Printed Portable Prayer Rugs (N=50)**

<b>Functional Value <sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b>Using this prayer rug would be comfortable.</b>			6.36	1.24
Strongly disagree	0	0.0		
Disagree	1	2.0		
Somewhat disagree	1	2.0		
Neutral	5	10.0		
Somewhat agree	1	2.0		
Agree	6	12.0		
Strongly agree	36	72.0		
<b>Using this prayer rug would be helpful.</b>			6.50	0.83
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	0	0.0		
Neutral	3	6.0		
Somewhat agree	2	4.0		
Agree	12	24.0		
Strongly agree	33	66.0		
<b>The weight of this prayer rug would be easy to carry.</b>			6.60	0.76
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	0	0.0		
Neutral	2	4.0		
Somewhat agree	2	4.0		
Agree	9	18.0		
Strongly agree	35	70.0		
<b>The thickness of this prayer rug would give me enough protection from scratching myself on the floor.</b>			6.18	1.26
Strongly disagree	1	2.0		
Disagree	1	2.0		
Somewhat disagree	0	0.0		
Neutral	1	2.0		
Somewhat agree	7	14.0		
Agree	12	24.0		
Strongly agree	27	54.0		

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree.

**Table 4.4- Respondents' Perceived Functional Value of Digitally-Printed Portable Prayer Rugs (N=50) (Continued)**

<b>Functional Value <sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b>The length and width of the portable prayer rug would be sufficient to kneel on.</b>			6.59	0.81
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	0	0.0		
Neutral	3	6.0		
Somewhat agree	1	2.0		
Agree	9	18.0		
Strongly agree	36	72.0		
<b>The folded size of the portable prayer rug would fit in my purse or backpack.</b>			6.48	1.01
Strongly disagree	0	0.0		
Disagree	1	2.0		
Somewhat disagree	0	0.0		
Neutral	2	4.0		
Somewhat agree	3	6.0		
Agree	9	18.0		
Strongly agree	35	70.0		
<b>The attached foldable case of the portable prayer rug would be useful.</b>			6.52	0.68
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	0	0.0		
Neutral	0	0.0		
Somewhat agree	5	10.0		
Agree	14	28.0		
Strongly agree	31	62.0		

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree.

### *Expressive Value*

Expressive value was recorded based on participants' perceptions about digitally-printed portable prayer rugs. Three questions on a 7-point Likert type scale ranging from Strongly Disagree (1) to Strongly Agree (7) were asked in the survey. These three specific questions were designed to measure the expressive aspect of the digitally-printed portable prayer rugs.

The mean score for the item "The incorporation of the *Kabah* in the design of the portable prayer rug would influence my purchase decision" was 5.28. With regard to that item 56.0% of the respondents (n=28) were likely to agree, while 34% of the respondents reported neutral responses (n=17) and 10% were likely to disagree (n=5).

However, based on the results from the open-ended question, 10% of the respondents (n=5) recommended including the *Kabah* in every prayer rug designs. While one of the respondents (2%) was more likely to agree about including the *Kabah* in Design #4, and she was less likely to agree about including the *Kabah* in Design #1. Further explanation about this participant's response about the incorporation of the *Kabah* in the design of the prayer rugs will be discussed in depth later.

The percentage indicates that the respondents were more likely to strongly agree with the item of "This portable prayer rug would be more compatible with my needs than the portable prayer rug(s) I already have" (n=38, 76%) (M=6.08) and some participants showed neutral/somewhat agree (n=10, 20%). Similarly, respondents were more likely to agree with the item "This portable prayer rug would be appropriate for my lifestyle" (n=47, 94%) (M=6.31). Results are shown in Table 4.5 below.

**Table 4.5- Respondents' Perceived Expressive Value of Digitally-Printed Portable Prayer Rugs (N=50)**

<b>Expressive Value <sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b><u>The incorporation of the <i>Kabah</i> in the design of the portable prayer rug would influence my purchase decision.</u></b>			5.28	1.74
Strongly disagree	2	4.0		
Disagree	1	2.0		
Somewhat disagree	2	4.0		
Neutral	17	34.0		
Somewhat agree	2	4.0		
Agree	6	12.0		
Strongly agree	20	40.0		
<b><u>This portable prayer rug would be more compatible with my needs than the portable prayer rug(s) I already have.</u></b>			6.08	1.21
Strongly disagree	0	0.0		
Disagree	1	2.0		
Somewhat disagree	1	2.0		
Neutral	4	8.0		
Somewhat agree	6	12.0		
Agree	13	26.0		
Strongly agree	25	50.0		
<b><u>This portable prayer rug would be appropriate for my lifestyle.</u></b>			6.31	1.02
Strongly disagree	0	0.0		
Disagree	1	2.0		
Somewhat disagree	0	0.0		
Neutral	1	2.0		
Somewhat agree	7	14.0		
Agree	12	24.0		
Strongly agree	28	56.0		

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree.

Even though the fourth question about evaluating “The motifs that are used to depict the *mihrab* in the portable prayer rug represents the atmosphere of the mosque” was not part of the expressive section, it was combined under this value because the symbol of the *mihrab* expresses a connection to Islam, which is an important value for Muslims. The results of respondents’



answers about evaluating “The motifs that are used to depict the *mihrab* in the portable prayer rug represent the atmosphere of the mosque” by each of the eight designs are shown below in Table 4.6. The percentage of responses indicated that respondents strongly agreed with the items “Design #7” (M=6.18) (n=50, 100%), followed by “Design #5” (M=6.06) (n=50, 100%) and “Design #6” (M=5.86) (n=50, 100%) to be the best three designs that where the motifs that are used to depict the *mihrab* in the digitally-printed portable prayer rug represented the atmosphere of the mosque. While “Design #1” had reported the lowest mean score (M=5.12) (n=50, 100%) of presenting the *mihrab* as a symbol of the atmosphere of the mosque, and that indicates the participants somewhat agreed. A bar chart related to this result is also presented. See Figure 4.43 below.

**Table 4.6- The Motifs that are Used to Depict the *Mihrab* in the Portable Prayer Rug Represent the Atmosphere of the Mosque (N=50)**

	(n)	M	SD
<b>Designs<sup>a</sup></b>			
Design #1	50	5.12	2.16
Design #2	47	5.45	1.63
Design #3	49	5.24	1.73
Design #4	49	5.67	1.57
Design #5	49	6.06	1.197
Design #6	50	5.86	1.55
Design #7	50	6.18	1.38
Design #8	50	5.20	1.90

Note:

a. Items are measured on seven-point Likert scale from 1= least preferred to 7= most preferred.

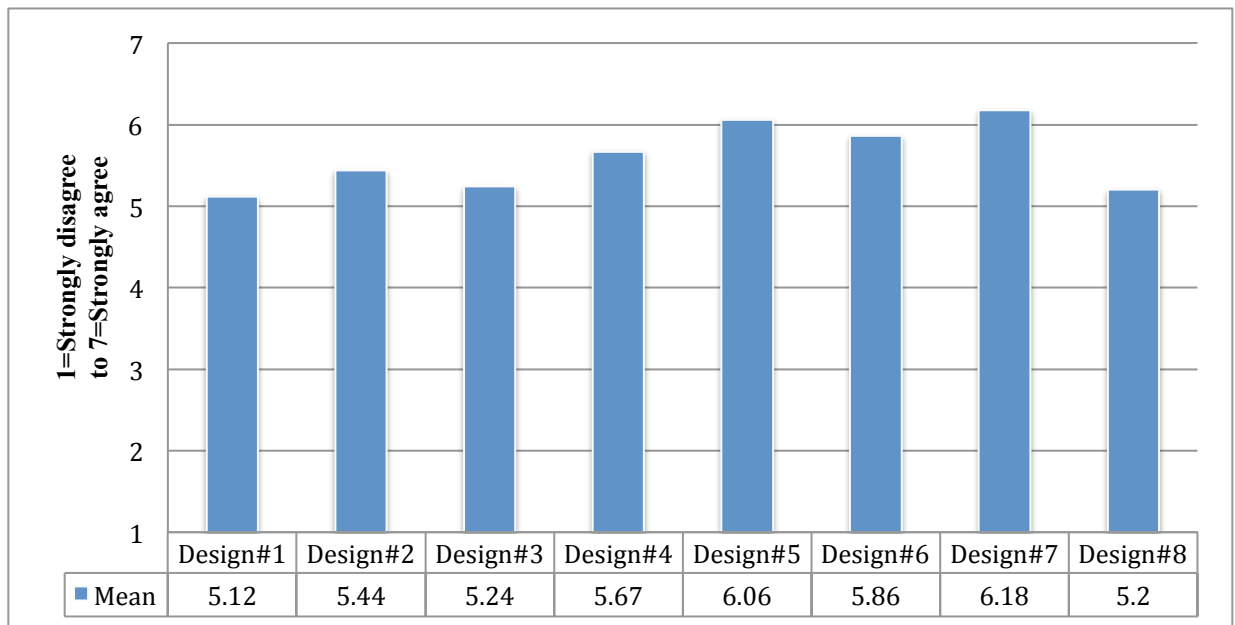


Figure 4.43- The motifs that are used to depict the *mihrab* in the portable prayer rug represent the atmosphere of the mosque.

### *Aesthetic Value*

Aesthetic value was recorded based on participants' perceptions about digitally-printed portable prayer rugs. Four questions on a 7-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (7) were asked in the survey.

The item "The appearance of the portable prayer rug is aesthetically appealing to me" had the highest mean score compared to other items, which were used to measure the aesthetic value of the digitally-printed portable prayer rugs. The mean score was 6.44. Respondents were more likely to agree with the item "The color of the portable prayer rug matches my favorite color(s)" (M=6.16).

Results show that the second highest mean score (M= 6.38) of the aesthetic value items was "The use of Islamic ornamentations to decorate/embellish the surface of portable prayer rugs is aesthetically appealing to me." Respondents were more likely to agree with the item "The color schemes are aesthetically appropriate for a prayer rug" (M=6.02). Results are shown in Table 4.7 below.

**Table 4.7- Respondents' Perceived Aesthetic Value of Digitally-Printed Portable Prayer Rugs (N=50)**

<b>Aesthetic Value <sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b>The appearance of the portable prayer rug is aesthetically appealing to me.</b>			6.44	0.84
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	0	0.0		
Neutral	2	4.0		
Somewhat agree	5	10.0		
Agree	12	24.0		
Strongly agree	31	62.0		

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree.

**Table 4.7- Respondents' Perceived Aesthetic Value of Digitally-Printed Portable Prayer Rugs (N=50) (Continued)**

<b>Aesthetic Value <sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b><u>The color of the portable prayer rug matches my favorite color(s).</u></b>			6.16	1.07
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	1	2.0		
Neutral	3	6.0		
Somewhat agree	9	18.0		
Agree	10	20.0		
Strongly agree	26	52.0		
<b><u>The use of Islamic ornamentations to decorate/embellish the surface of portable prayer rugs is aesthetically appealing to me.</u></b>			6.38	0.92
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	1	2.0		
Neutral	0	0.0		
Somewhat agree	9	18.0		
Agree	9	18.0		
Strongly agree	31	62.0		
<b><u>The color schemes are aesthetically appropriate for a prayer rug.</u></b>			6.02	1.19
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	3	6.0		
Neutral	2	4.0		
Somewhat agree	10	20.0		
Agree	11	22.0		
Strongly agree	24	48.0		

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree.

### **Evaluating the Design Elements of Digitally-Printed Portable Prayer Rugs**

The design elements of the digitally-printed portable prayer rugs were evaluated by female Muslim participants based on their personal preferences. Three questions on a 7-point Likert type scale ranging from Least Preferred (1) to Most Preferred (7) were asked in the survey

to evaluate each one of the eight prayer rugs designs for color, level of complexity of the design, and drawing (design of Islamic ornamentations). The results are recorded below in Table 4.8.

**Table 4.8- Participants Preferences of the Design Elements of Digitally-Printed Portable Prayer Rugs (N=50)**

	(n)	(%)	M	SD
<b>Design Elements</b>				
<b>Design #1</b>				
Color	49	98	5.00	1.63
Drawing (Design of Islamic ornamentations)	49	98	5.18	1.76
Level of complexity of the design	50	100	5.16	1.50
<b>Design #2</b>				
Color	48	96	4.73	1.92
Drawing (Design of Islamic ornamentations)	50	100	5.66	1.53
Level of complexity of the design	50	100	5.76	1.54
<b>Design #3</b>				
Color	49	98	5.22	1.72
Drawing (Design of Islamic ornamentations)	49	98	5.37	1.67
Level of complexity of the design	50	100	5.12	1.80
<b>Design #4</b>				
Color	50	100	5.16	1.89
Drawing (Design of Islamic ornamentations)	48	96	5.50	1.62
Level of complexity of the design	50	100	5.66	1.49
<b>Design #5</b>				
Color	49	98	5.71	1.38
Drawing (Design of Islamic ornamentations)	50	100	5.76	1.40
Level of complexity of the design	49	98	5.78	1.31
<b>Design #6</b>				
Color	50	100	4.66	1.99
Drawing (Design of Islamic ornamentations)	50	100	5.74	1.38
Level of complexity of the design	50	100	5.76	1.34
<b>Design #7</b>				
Color	50	100	5.74	1.73
Drawing (Design of Islamic ornamentations)	50	100	6.26	1.10
Level of complexity of the design	50	100	6.16	1.18
<b>Design #8</b>				
Color	50	100	5.28	1.90
Drawing (Design of Islamic ornamentations)	50	100	5.02	1.88
Level of complexity of the design	50	100	5.10	1.89

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree.



## Color

Descriptive statistics of responses indicated that respondents most preferred the color of Design #7 (M=5.74) (n=50, 100%), followed by Design #5 (M=5.71) (n=49, 98%) and Design #8 (M=5.28) (n=50, 100%), which were the best three designs in terms of color. Respondents least preferred that the color of Design #6 (M=4.66) (n=50, 100%), and the color of Design #2 (M=4.73) (n=48, 96%); however, the mean scores of these two designs were close to neutral. Results are shown below in Figure 4.44. Further details on these results will be discussed later.

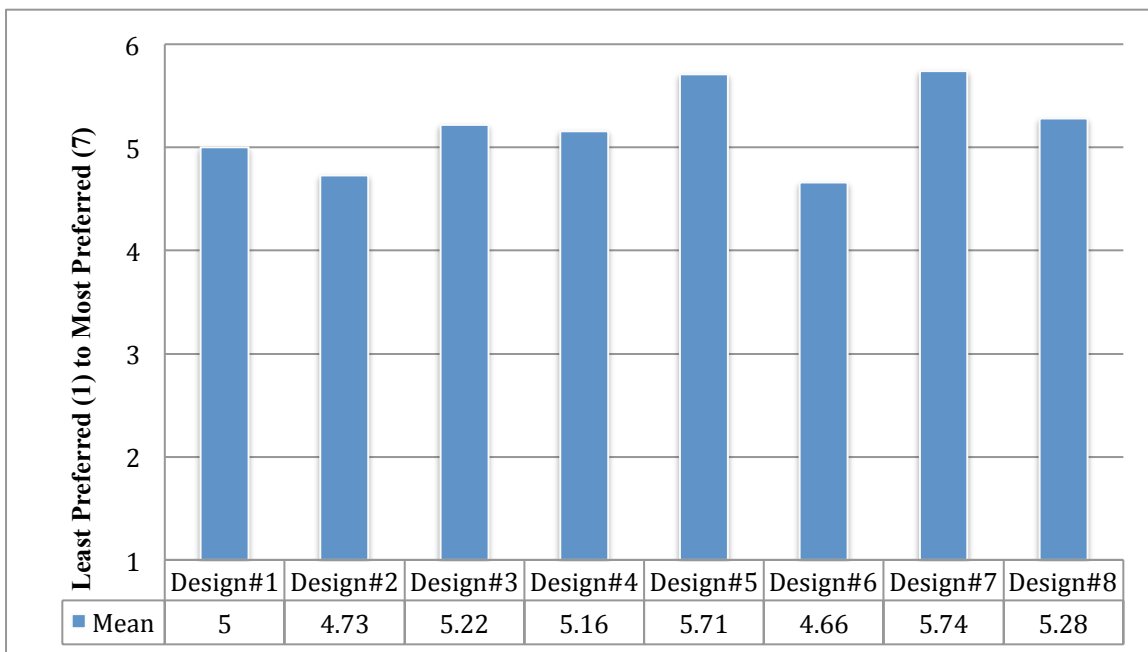


Figure 4.44- Design Elements (Color).

## Drawing (Design of Islamic ornamentations)

Respondents most preferred the drawing of Design # 7 (M=6.26) (n=50, 100%), Design #5 (M=5.76) (n=50, 100%), and Design #6 (M=5.74) (n=50, 100%), which were the best three drawn designs. Respondents least preferred the drawing of Design #8 (M=5.02) (n=50, 100%)

and the drawing of Design #1 (M=5.18) (n=49, 98%); however, the mean scores of these two designs were close to “somewhat prefer.” Results are shown below in Figure 4.45. More details on these results will be discussed later.

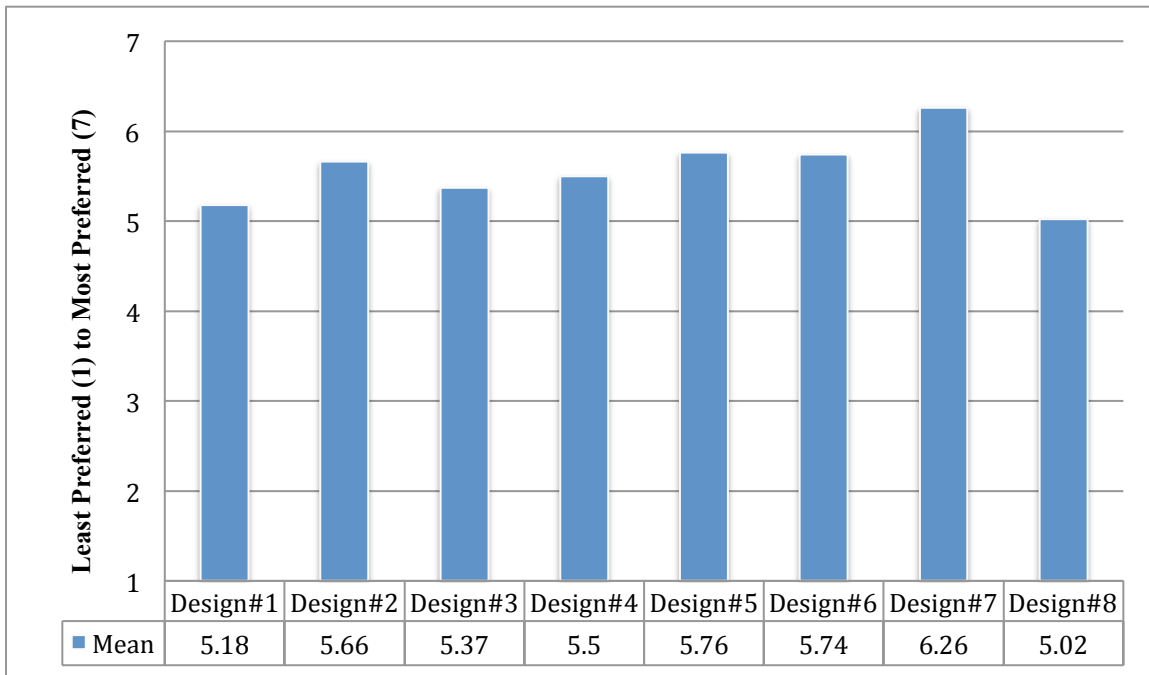


Figure 4.45- Design Elements (Drawing/Design of Islamic ornamentations).

*Level of complexity of the design*

Results show that the respondents most preferred the level of complexity of Design #7 (M=6.16) (n=50, 100%), Design #5 (M=5.78) (n=49, 98%), Design #6 (M=5.76) (n=50, 100%), and Design #2 (M=5.76) (n=50, 100%). Respondents least preferred the level of complexity of Design #8 (M=5.10) (n=50, 100%), Design #3 (M=5.12) (n=50, 100%), and Design #1 (M=5.16) (n=50, 100%); however, the mean scores of these three designs were close to “somewhat prefer.” Results are shown below in Figure 4.46. Further details on these results will be discussed later.

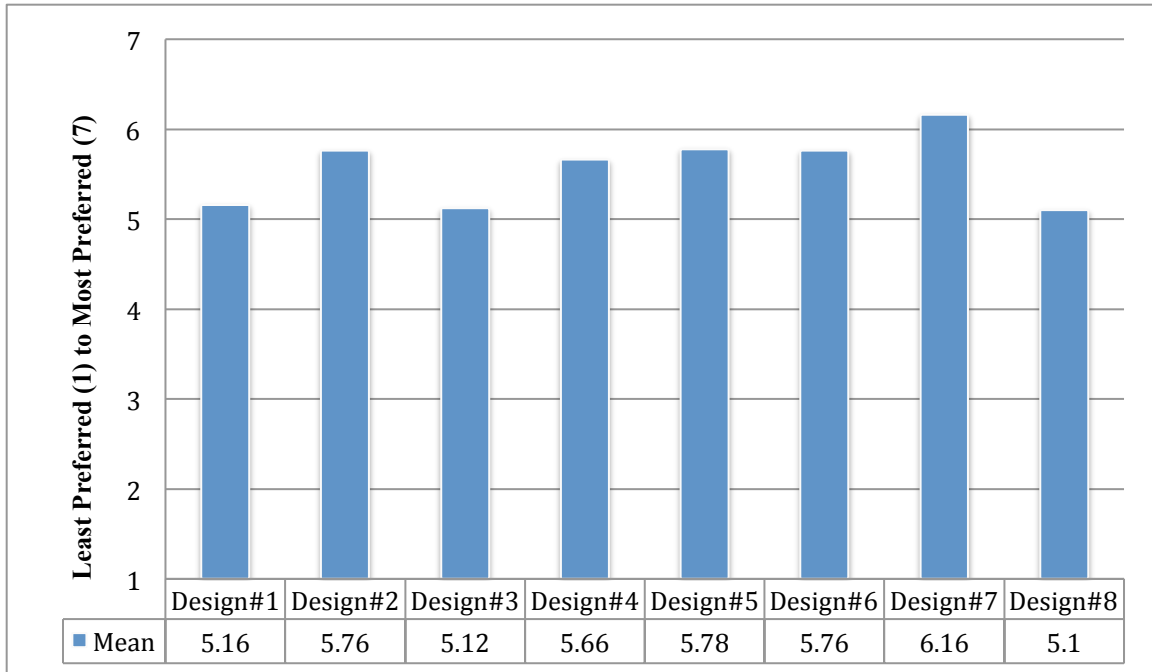


Figure 4.46- Design Elements (Level of complexity of the design).

### Overall Evaluation of the Eight Digitally-Printed Portable Prayer Rugs

Descriptive statistics were calculated to examine respondents' perceptions of the overall evaluation of the digitally-printed portable prayer rugs. The overall evaluation of the eight digitally-printed portable prayer rugs consisted of four items, which were color, drawing, level of complexity of design, and the motifs that are used to depict the *mihrab* in the portable prayer rug to present the atmosphere of the mosque. Respondents most preferred Design #7 (M=6.09) (n=50, 100%), followed by Design #5 (M=5.87) (n=48, 96%), Design #6 (M=5.51) (n=50, 100%), and Design #4 (M=5.51) (n=47, 94%).

Respondents least preferred the overall evaluation Design #1 (M=5.9) (n=48, 96%), followed by Design #3 (M=5.25) (n=47, 94%), and Design #8 (M=5.15) (n=50, 100%); however, the mean scores of these three designs were close to "somewhat prefer." Results are shown

below in Table 4.9 and Figure 4.47. The relationship between evaluating each element of the design and the overall evaluation of the eight designs will be discussed later.

**Table 4.9- Overall Evaluation of the Eight Digitally-Printed Portable Prayer Rugs (N=50)**

	(n)	(%)	M	SD
<b>Designs<sup>a</sup></b>				
Design #1	48	96	5.09	1.38
Design #2	46	92	5.45	1.35
Design #3	47	94	5.25	1.38
Design #4	47	94	5.51	1.27
Design #5	48	96	5.87	0.98
Design #6	50	100	5.51	1.24
Design #7	50	100	6.09	1.08
Design #8	50	100	5.15	1.65

Note:

a. Items are measured on seven-point Likert scale from 1= least preferred to 7= most preferred.

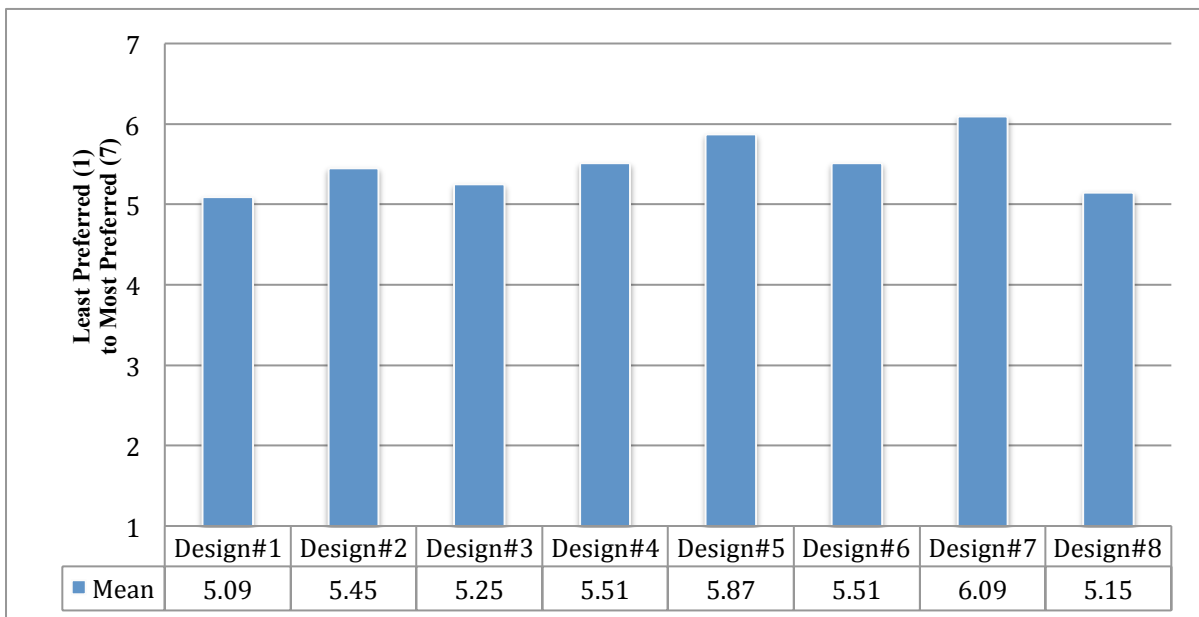


Figure 4.47- Overall evaluation of the eight digitally-printed portable prayer rugs.

### **Attitude Towards Purchasing Digitally-Printed Portable Prayer Rugs**

Composite scores were calculated to examine respondents' attitudes towards purchasing digitally-printed portable prayer rugs. Three questions on a 7-point semantic differential scale, ranging from 1=bad to 7=good, 1=unfavorable to 7=favorable, and 1=foolish to 7=wise, were asked in the survey. The results indicated that the majority of respondents were more likely to agree with the item "To me, purchasing digitally-printed portable prayer rug is good." The mean score for this item was significantly high (M=6.42). The percentages indicated that respondents were more likely to agree with the item "To me, purchasing digitally-printed portable prayer rug is favorable." The mean score for this item was 6.12. Similarly, the percentages indicated that respondents were more likely to agree with the item "To me, purchasing digitally-printed portable prayer rug is wise". The mean score for this item was 6.39. Results are shown below in Table 4.10.



**Table 4.10- Participants Attitude Towards Purchasing Digitally-Printed Portable Prayer Rugs (N=50)**

<b>Attitude <sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b>Good</b>	50	100	6.42	0.99
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	1	2.0		
Neutral	2	4.0		
Somewhat agree	6	12.0		
Agree	7	14.0		
Strongly agree	34	68.0		
<b>Favorable</b>	49	98	6.12	1.33
Strongly disagree	0	0.0		
Disagree	1	2.0		
Somewhat disagree	2	4.0		
Neutral	5	10.0		
Somewhat agree	3	6.0		
Agree	9	18.0		
Strongly agree	29	58.0		
<b>Wise</b>	49	98	6.39	1.08
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	1	2.0		
Neutral	4	8.0		
Somewhat agree	4	8.0		
Agree	6	12.0		
Strongly agree	34	68.0		

Note:

a. Items are measured on a seven-point semantic differential scale from 1=bad to 7=good, 1=unfavorable to 7=favorable, and 1=foolish to 7=wise.

## **Purchase Intention of Digitally-Printed Portable Prayer Rugs**

Composite scores were calculated to examine respondents' purchase intention of digitally-printed portable prayer rugs. Six questions on a 7-point Likert type scale ranging from Least Preferred (1) to Most Preferred (7) were asked in the survey. The results are recorded in several tables below. The percentages indicated that respondents strongly agreed with the item "I intend to try this type of prayer rug. The mean score for this item was 6.26.

On the one hand, the percentages indicated that respondents were more likely to agree with the item "It is likely that I will buy this prayer rug when it becomes available" (M=6.36). On the other hand, 90% of the respondents were more likely to agree with the item "I would purchase this prayer rug" with a high mean score (M=6.40). These results will be further explained by the results of the open-ended question later.

The percentages indicated that respondents strongly agreed with the item "This prayer rug as an ethical and socially responsible product would influence my purchase decision" (M=6.36). Similarly, 52% of the participants strongly agreed with the item "This prayer rug as an environmentally friendly product would influence my purchase decision". The mean score for this item was 6.22.

The results indicated that the majority of respondents strongly agreed with the item "If I knew that the money from purchasing this prayer rug went to low-income women who made the rug that would influence my purchase decision". The mean score of this item was significantly high (M=6.54) compared to the other items, which were used to measure female Muslim consumers' intention of purchasing digitally-printed portable prayer rugs. Participants felt strongly about this item and further details about the results will be discussed later. Results are displayed in Table 4.11.

**Table 4.11- Participants Purchase Intention of Digitally-Printed Portable Prayer Rugs (N=50)**

<b>Purchase Intention<sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b>I intend to try this type of prayer rug.</b>	50	100	6.26	1.17
Strongly disagree	0	0.0		
Disagree	1	2.0		
Somewhat disagree	0	0.0		
Neutral	5	10.0		
Somewhat agree	4	8.0		
Agree	9	18.0		
Strongly agree	31	62.0		
<b>It is likely that I will buy this prayer rug when it becomes available.</b>	50	100	6.36	1.19
Strongly disagree	1	2.0		
Disagree	0	0.0		
Somewhat disagree	1	2.0		
Neutral	2	4.0		
Somewhat agree	2	4.0		
Agree	12	24.0		
Strongly agree	32	64.0		
<b>I would purchase this prayer rug.</b>	50	100	6.40	1.16
Strongly disagree	1	2.0		
Disagree	0	0.0		
Somewhat disagree	0	0.0		
Neutral	4	8.0		
Somewhat agree	0	0.0		
Agree	12	24.0		
Strongly agree	33	66.0		
<b>This prayer rug as an ethical and socially responsible product would influence my purchase decision.</b>	50	100	6.36	0.98
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	1	2.0		
Neutral	3	6.0		
Somewhat agree	3	6.0		
Agree	13	26.0		
Strongly agree	30	60.0		

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree

**Table 4.11- Participants Purchase Intention of Digitally-Printed Portable Prayer Rugs (N=50) (Continued)**

<b>Purchase Intention<sup>a</sup></b>	<b>(n)</b>	<b>(%)</b>	<b>M</b>	<b>SD</b>
<b><u>This prayer rug as an environmentally friendly product would influence my purchase decision.</u></b>	50	100	6.22	1.07
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	2	4.0		
Neutral	3	6.0		
Somewhat agree	3	6.0		
Agree	16	32.0		
Strongly agree	26	52.0		
<b><u>If I knew that the money from purchasing this prayer rug went to low-income women who made the rug that would influence my purchase decision.</u></b>	50	100	6.54	0.88
Strongly disagree	0	0.0		
Disagree	0	0.0		
Somewhat disagree	1	2.0		
Neutral	2	4.0		
Somewhat agree	1	2.0		
Agree	11	22.0		
Strongly agree	35	70.0		

Note:

a. Items are measured on seven-point Likert scale from 1=strongly disagree to 7=strongly agree

Descriptive statistics were conducted to examine the amount of money that participants were willing to pay for the digitally-printed portable prayer rug. Approximately almost 40% of the participants were willing to pay less than \$30 for the digitally-printed portable prayer rug (n=19), 30% of participants were willing to pay \$31 - \$40 (n=15), 6% of participants were willing to pay \$41 - \$50 (n=3), 4% of participants were willing to pay \$51 - \$60 (n=2), 2% of participants were willing to pay \$61 - \$70 (n=1), and 18% of participants were willing to pay another amount of money (n=9). With regards to the other amount of money that participants are

willing to pay for the digitally-printed portable prayer rug ranged from \$10-\$30, and the mean score was almost \$25 (SD= 6.82). Results are shown in Table 4.12 below.

**Table 4.12- The Amount of Money that Participants are Willing to Pay for the Digitally-Printed Portable Prayer Rug (N=50)**

	(n)	(%)	M	SD
<b>Willing to Pay</b>				
Less than \$30	19	38.0		
\$31 - \$40	15	30.0		
\$41 - \$50	3	6.0		
\$51 - \$60	2	4.0		
\$61 - \$70	1	2.0		
Other	9	18.0	\$24.44	6.82
Missing	1	2.0		

### **Measurements of Female Muslim Consumer Preferences Related to Digitally-Printed Portable Prayer Rugs in the Context of the FEA Consumer Needs Model**

Descriptive statistics were conducted to examine respondents’ perceptions of the digitally-printed portable prayer rugs in the context of the FEA Consumer Needs Model, which included functional value, expressive value and aesthetic value, in several tables below.

#### *Functional value of digitally-printed portable prayer rugs*

The functional value of the digitally-printed portable prayer rugs consisted of seven items. The reliability (Cronbach’s Alpha) of the scale for functional value was 0.65. The mean score for the functional value was 6.46 (Table 4.13.1).



**Table 4.13.1- Reliability of Measurement Items Regarding the Functional Value of Digitally-Printed Portable Prayer Rugs (N=50)**

	<b>M</b>	<b>Reliability</b>
<b>Functional Value</b>	6.46	0.65
Using this prayer rug would be comfortable.		
Using this prayer rug would be helpful.		
The weight of this prayer rug would be easy to carry.		
The thickness of this prayer rug would give me enough protection from scratching myself on the floor.		
The length and width of the portable prayer rug would be sufficient to kneel on.		
The folded size of the portable prayer rug would fit in my purse or backpack.		
The attached foldable case of the portable prayer rug would be useful.		

*Expressive value of digitally-printed portable prayer rugs*

The expressive value of the digitally-printed portable prayer rugs consisted of two items. The reliability (Cronbach’s Alpha) of the scale for expressive value was 0.59. The mean score for the expressive value was 6.18. Results are shown below in Table 4.13.2.

**Table 4.13.2- Reliability of Measurement Items Regarding the Expressive Value of Digitally-Printed Portable Prayer Rugs (N=50)**

	<b>M</b>	<b>Reliability</b>
<b>Expressive Value</b>	6.18	0.59
This portable prayer rug would be more compatible with my needs than the portable prayer rug(s) I already have.		
This portable prayer rug would be appropriate for my lifestyle.		

*Aesthetic value of digitally-printed portable prayer rugs*

The aesthetic value of the digitally-printed portable prayer rugs consisted of four items. The reliability (Cronbach’s Alpha) of the scale for aesthetic value was 0.82. The mean score for the aesthetic value was 6.26 (Table 4.13.3).

**Table 4.13.3- Reliability of Measurement Items Regarding the Aesthetic Value of Digitally-Printed Portable Prayer Rugs (N=50)**

	<b>M</b>	<b>Reliability</b>
<b>Aesthetic Value</b>	6.26	0.82
The appearance of the portable prayer rug is aesthetically appealing to me.		
The color of the portable prayer rug matches my favorite color(s).		
The use of Islamic ornamentations to decorate/embellish the surface of portable prayer rugs is aesthetically appealing to me.		
The color schemes are aesthetically appropriate for a prayer rug.		

### **Attitude towards purchasing digitally-printed portable prayer rugs**

The attitude of female Muslim consumers toward the digitally-printed portable prayer rugs consisted of three items. The reliability (Cronbach’s Alpha) of the scale for attitude was 0.92. The mean score for the attitude towards purchasing digitally-printed portable prayer rugs was 6.31 (Table 4.14).

**Table 4.14- Reliability of Measurement Items Regarding Attitude Towards Purchasing Digitally-Printed Portable Prayer Rugs (N=50)**

	<b>M</b>	<b>Reliability</b>
<b>Attitude</b>	6.31	0.92
To me, purchasing digitally printed portable prayer rug is “Bad/ Good”.		
To me, purchasing digitally printed portable prayer rug is “Unfavorable/ Favorable”.		
To me, purchasing digitally printed portable prayer rug is “Foolish/ Wise”.		

### **Purchase intention of digitally-printed portable prayer rug**

The purchase intention of the digitally-printed portable prayer rugs consisted of six items. The reliability (Cronbach’s Alpha) of the scale for purchase intention was 0.83. The mean score for the purchase intention of digitally-printed portable prayer rugs was 6.36 (Table 4.15).

**Table 4.15- Reliability of Measurement Items Regarding Purchase Intention of Digitally-Printed Portable Prayer Rug (N=50)**

	<b>M</b>	<b>Reliability</b>
<b>Purchase Intention</b>	6.36	0.83
I intend to try this type of prayer rug.		
It is likely that I will buy this prayer rug when it becomes available.		
I would purchase this prayer rug.		
This prayer rug as an ethical and socially responsible product would influence my purchase decision.		
This prayer rug as an environmentally friendly product would influence my purchase decision.		
If I knew that the money from purchasing this prayer rug went to low-income women who made the rug that would influence my purchase decision.		

### **Research Question One**

The first research question was: will Muslim female consumers be interested in purchasing digitally-printed portable prayer rugs? Regression analysis was conducted to examine whether the participants' purchase intention of digitally-printed portable prayer rugs would be affected by their attitude toward purchasing digitally-printed portable prayer rug. The independent variable was attitude and the dependent variable was purchase intention. Regression analysis revealed that the overall model predicting the purchase intention of digitally-printed portable prayer rugs was significant ( $R^2 = 0.17$ ,  $F = 9.56$ ,  $p < 0.001$ ). Specifically, results showed that the attitude of female Muslim consumers toward digitally-printed portable prayer rug positively affected their purchase intention of digitally-printed portable prayer rugs ( $\beta = 0.41$ ,  $t = 3.09$ ,  $p < 0.001$ ). Results are shown in Table 4.16.1 and Table 4.16.2.

**Table 4.16.1- Regression Analysis of Being Interested on Purchasing Digitally-Printed Portable Prayer Rugs**

	<i>df</i>	<i>R</i> <sup>2</sup>	<i>F</i>	<i>β</i>	<i>t</i> -Value	<i>Sig</i>
<b>Dependent Variables: Purchase Intention of Digitally-Printed Portable Prayer Rugs</b>	47	0.17	9.56			0.003 <sup>b</sup>
Attitude				0.41	3.09	0.003***

Note: \*p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

Regression analysis was conducted again to examine which type(s) of value would influence the attitudes of female Muslim consumers toward purchasing digitally-printed portable prayer rugs. The independent variables were functional, expressive, and aesthetic values, which were tested against the dependent variable of attitude towards purchasing digitally-printed portable prayer rugs. The second regression analysis showed that the overall model predicting the participants' attitude toward purchasing digitally-printed portable prayer rugs was significant ( $R^2 = 0.46$ ,  $F = 11.83$ ,  $p < 0.001$ ). Specifically, results showed that the functional value of digitally-printed portable prayer rug positively affected the attitude of female Muslim consumers toward purchasing those rugs ( $\beta = 0.30$ ,  $t = 2.23$ ,  $p < 0.01$ ), followed by the expressive value ( $\beta = 0.33$ ,  $t = 1.99$ ,  $p < 0.05$ ). There was no significant effect of aesthetic value on female Muslim consumers' attitudes toward purchasing those rugs (Table 4.16.2).

**Table 4.16.2- Regression Analysis for the Participants' Attitude Toward Purchasing Digitally-Printed Portable Prayer Rugs in the Context of FEA Model**

	<i>df</i>	<i>R</i> <sup>2</sup>	<i>F</i>	<i>β</i>	<i>t</i> -Value	<i>Sig</i>
<b>Dependent Variables: Attitude Towards Purchasing Digitally-Printed Portable Prayer Rugs</b>	41	0.46	11.83			0.000 <sup>b</sup>
Functional				0.30	2.23	0.031**
Expressive				0.33	1.99	0.053*
Aesthetic				0.20	1.37	0.18

Note: \*p<0.05, \*\* p<0.01, \*\*\* p<0.001

## Research Question Two

The second research question was: of the three dimensions in the FEA model (functional, expressive, aesthetic), which is the most influential in affecting the purchase intention of Muslim female consumers? Regression analysis was conducted to test which of the three dimensions in the FEA model (functional, expressive, and aesthetic) was the most influential in affecting the purchase behavior of Muslim female consumers. Functional, expressive, and aesthetic values were the independent variables and purchase intention was the dependent variable. Regression analysis showed that the overall model to predict the purchase intention of digitally-printed portable prayer rugs was significant ( $R^2 = 0.49$ ,  $F = 13.29$ ,  $p < 0.001$ ). The results showed that the functional value of the digitally-printed portable prayer rug was the most influential factor affected the purchase behavior of female Muslim consumers ( $\beta = 0.42$ ,  $t = 3.27$ ,  $p < 0.001$ ). While the expressive factor was the second influential factor affected the purchase behavior of female Muslim consumers with regard to digitally-printed portable prayer rugs ( $\beta = 0.32$ ,  $t = 2.04$ ,  $p < 0.05$ ). The result showed that the aesthetic factor did not have a significant effect on the purchase behavior of female Muslim consumers toward digitally-printed portable prayer rugs ( $\beta = 0.08$ ,  $t = 0.58$ ,  $p > 0.05$ ). Results are shown below in Table 4.17.

**Table 4.17- Regression Analysis for the Effect of the FEA Model on Purchasing Digitally-Printed Portable Prayer Rugs**

	<i>df</i>	<i>R</i> <sup>2</sup>	<i>F</i>	$\beta$	<i>t</i> -Value	<i>Sig</i>
<b>Dependent Variables: Purchase Intention of Digitally-Printed Portable Prayer Rugs</b>	42	0.49	13.29			0.000 <sup>b</sup>
Functional				0.42	3.27	0.002***
Expressive				0.32	2.04	0.048*
Aesthetic				0.08	0.58	0.570

Note: \* $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



## CHAPTER 5- DISCUSSION, CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS FOR FUTURE RESEARCH

### **Discussion**

In Islamic culture, prayer is an integral part of each Muslim's day. Thus, Muslims utilize a prayer rug as a means of separating themselves from the dirt of the floor while praying towards Mecca. Due to the necessity of working outside the home, Muslim people need portable prayer rugs to facilitate daily prayers. Due to the fact that the outlook of Muslim consumers has changed over time, it is important to develop a prayer rug that meets current Muslim consumers' needs. There is a lack of literature that relates to female Muslim consumers behavior regarding prayer rugs, in general, and portable prayer rugs, specifically.

The purpose of this study was to investigate female Muslim consumer preferences related to digitally-printed portable prayer rugs in the context of the FEA consumer needs model. The first aim of this research was to design and produce a collection of eight digitally-printed portable prayer rugs using motifs influenced by Islamic ornamental art. This small collection of digitally printed portable prayer rugs were used as examples in this research. The second aim was to describe the sources of inspiration for portable prayer rug designs. The third aim of this research was to measure the level of interest among Muslim women to purchase digitally-printed portable prayer rugs for their functional, expressive, and aesthetic values through a survey approach. The final aim was to examine the idea of producing digitally-printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women, simultaneously influencing the purchase decisions of socially concerned Muslim consumers. The

FEA consumer needs model (Lamb & Kallal, 1992) was used as framework for the study in order to evaluate the digitally-printed portable prayer rugs.

In this chapter, the major findings of this research study are presented along with relevant, theoretical and practical implications, limitations associated with study, and recommendations for future research.

The following discussion is guided by the research questions to present the major findings of conducting this research.

**Question one: Would Muslim female consumers be interested in purchasing digitally printed portable prayer rugs?**

Overall, the findings indicated that the attitude of female Muslim consumers toward digitally-printed portable prayer rug positively affected their purchase intention of these rugs. More specifically, the results showed that the majority of participants considered that purchasing digitally-printed portable prayer rugs would be a good decision. Study participants stated their opinions about appreciating the developed digitally-printed portable prayer rugs in different ways.

*“Excellent product! Great design and idea.”* (Participant 18)

*“Keep the good work and God bless you. Good Luck.”* (Participant 35)

*“It is great.”* (Participant 46)

The previous quotes showed that the participants agreement about liking the idea of using digital printing method to produce portable prayer rugs.

In turn, the positive attitude of participants toward digitally-printed portable prayer rugs had a positive impact on increasing their level of interest in purchasing those rugs as soon as they become available on the market. Study participants stated that they were looking to purchase the

digitally-printed portable prayer rugs as soon as they become produced. *“Good Strong Idea!! I want it as soon as it becomes available.”* (Participant 45)

The previous quote showed the participants’ excitement to purchase them when they are for sale. In addition, a couple of the participants were so excited to purchase some of the digitally-printed portable rugs during the focus group session, that they asked the researcher if they were already available for sale.

Additionally, the findings indicated that the concept of producing digitally-printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women positively affected the female Muslim consumers’ intention to purchase digitally-printed portable prayer rugs. Study participants stated their opinions about appreciating the idea of buying the digitally-printed portable prayer rugs as a way to help low-income women to improve the quality of their life. For example, one of the participants expressed her opinion about liking that idea by saying:

*“I like this idea and wish the better for you. Good luck.”* (Participant 8)

On the one hand, as previously described, the female Muslim consumers were interested in purchasing the digitally-printed portable prayer rugs as they become available for marketing and even interested in how they were made.

On the other hand, regarding the average amount of money that participants were willing to spend on purchasing the digitally-printed portable prayer rugs, we got an unexpected result, which was less than \$30, more specifically \$25 for each rug. This amount of money would not cover the cost of the production of these rugs using the digital method. We speculate this result was due to the lack of consumers’ knowledge about this printing technique. For instance, most of the participants during the focus group asked the researcher about the production method

including the printing process. This result could be different if the participants were more aware about the digital-printing method, which is connected to their educational background.

**Question two: Of the three dimensions in the FEA model (functional, expressive, aesthetic), which was the most influential in affecting the purchase behavior of Muslim female consumers?**

The overall results indicated that the functional value of the digitally-printed portable prayer rug was the most influential factor affecting the purchase intention of female Muslim consumers towards purchasing those rugs.

More specifically, results showed consensus that the weight of the digitally-printed portable prayer rugs would be easy to carry and using them would be helpful.

*“You did very well. I am so proud of you and for doing this. May Allah bless you for thinking about us Muslim women so they can pray outside. May Allah succeed you in your business.”* (Participant 48)

The previous quote showed the participants agreement with using the digitally-printed portable prayer rugs would be easy to carry around and helpful for them to facilitate their daily prayers.

In addition, the findings indicated that the majority of participants were more likely to agree with the length and width of the portable prayer rug would be sufficient for them to kneel on. This result means the developed size of the digitally-printed portable prayer rugs successfully met most of the participants’ needs in terms of having portable prayer rugs with sufficient size to kneel on compared to the current pocket-sized portable prayer rugs. The developed size of the digitally-printed portable prayer rug is 3.7 ft. x 2.3 ft., while the size of the current pocket-sized prayer is 3.2 ft. x 1.7 ft. (TÖNÜK, 2011).

Results regarding the thickness of the digitally-printed portable prayer rugs would give the participants enough protection from scratching themselves on the floor had the lowest mean score compared to other items, which was used to measure the functional value. The mean score of that item was close to “agree.” We speculate this result occurred due to the limitation of measuring the protection feature of the functional value of the digitally-printed portable prayer rugs through using a survey method. A similar method was used to measure the mobility of soccer uniforms (Holland, 2007).

In our case, assessing the protection feature of digitally-printed portable prayer rugs would give us more adequate results if we gave the participants the opportunity to use the product, and then evaluate it based on their experience with it instead of evaluating the product using a survey without reporting their use experience. We conclude that improving the thickness feature of the portable prayer rug was the most challenging feature to improve because many people usually prefer using prayer rugs that are thick and cushioned to promote comfort and extra protection, which can add more weight to the rug and affect the portability of the rug (utility and mobility).

Findings related to the folded size of the digitally-printed portable prayer rugs and if it would fit in the participant’s purse or backpack agreed that it would be small enough to put in their bag. Study participants stated that it’s a good idea to fold the portable prayer rugs into a shape resembling a fashionable wallet.

*“Good a portable prayer rug.”* (Participant 4)

*“It is a good idea for people who work or study to be in their bag.”* (Participant 14)

In terms of the quality of the digitally-printed portable prayer rugs, the participants expressed their appreciation of the quality of these rugs. An emphasis of the previous notion was



expressed by some of the participants: “It is very nicely done.” (Participant 17); “*Excellent product! Great design and idea.*” (Participant 18); “*So good work. The material is very good, the designs are gorgeous.*” (Participant 20); and “*I believe when Muslim person design and produced the prayer rug, it makes a huge difference. Muslims know the needs and how to improve the quality.*” (Participant 50).

The participant added that when the researcher with an Islamic background worked as a designer and developer on improving the quality of the current portable prayer rugs, positive achievements were possible. This suggests that the digitally-printed portable prayer rugs developed under this study successfully met most of the participants needs.

Finally, among the seven items that were used to measure the functional value of the digitally printed portable prayer rug, the results showed one hundred percent of the participants agreed that the attached foldable case of the portable prayer rug would be useful. Some of the participants expressed appreciation for the foldable case.

*“What a wonderful idea!”* (Participant 16)

## **Conclusions**

Guided by the research questions, the intent of this study was to further understand female Muslim consumers’ shopping behavior related to prayer rugs, their preferences regarding digitally-printed portable prayer rugs in the context of the FEA consumer needs model, and their attitudes and purchase intentions associated with digitally-printed portable prayer rugs. Lastly, this study examined the idea of producing digitally-printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women.

The FEA consumer needs model by Lamb and Kallal (1992) was used to better understand female Muslim consumers purchase preferences of digitally-printed portable rugs

based on measuring their level of interest among the functional, expressive, and aesthetic values of those rugs. The research questions were answered through testing the relationships between the variables of FEA factors, attitude, and purchase intention.

Regarding female Muslim consumers' interest to purchase digitally-printed portable prayer rugs, the participants' positive attitude toward digitally-printed portable prayer rugs significantly influenced their purchase intention to purchase these rugs. Based on this result, we conclude that the female Muslim consumers were interested in purchasing the digitally-printed portable prayer rugs. Contrary to the results of this study, other study found that "while consumers have generally positive attitudes toward ethical and/or socially responsible products, their actual intentions and behavior are not usually consistent with that positive attitude" (White et al., 2012, cited in Vitell, 2015, p. 772).

Also, regarding the FEA consumers need model and measuring which of the three dimensions of this model including functional, expressive, and aesthetic would be the most influential in affecting the purchase behavior of female Muslim consumers was answered. The functional value of digitally-printed portable prayer rugs positively affected the attitude of female Muslim consumers towards purchasing those rugs. Similar to the finding of Green, and Peloza, (2011), the main factor behind consumers' decision-making in their study was the functional value of the product including quality and its price.

Examining the opportunity of producing and marketing digitally-printed portable prayer rugs as a social enterprise to provide employment for low-income Muslim women and its influence on the purchase decisions of socially concerned Muslim consumers was accomplished. It was revealed that using the money of purchasing digitally-printed portable prayer rugs to pay the wages for low-income women who made the portable prayer rugs significantly positively

influenced the female Muslim consumers' purchase decision toward purchasing these rugs. Thus, the strategy of marketing digitally-printed portable prayer rugs as a socially responsible product (fair trade product) positively influenced the purchase decision of female Muslim consumers to purchase those rugs. Consistent with the findings of this study, a recent study by Vitell (2015) found that a significant increase in terms of interest in purchasing fair trade products can be generated when consumers are informed as to how any perceived injustices can be redressed through fair trade purchases.

Based on the previous results, we conclude that the functional value of the digitally-printed portable prayer rugs and promoting these rugs as socially responsible products/ fair trade product were the major factors that influenced the purchase decision of female Muslim consumers toward purchasing those rugs.

## **Implications**

### *Theoretical Implications*

In general, this study extended the body of knowledge about the female Muslim consumers' shopping behavior regarding prayer rugs and their preferences related to digitally-printed portable prayer rugs in the context of the FEA consumer needs model including their attitudes and purchase intentions. Specifically, there are two implications. First, most previous studies on the area of prayer rugs development focused on developing the functional aspect of individual home prayer rugs. For instance, the world's first physiological prayer rug evolved and was marketed to people with flexibility problems due to pregnancy, joint pain, excess weight, or bad posture (Huffington Post, 2013). Also, the Memory prayer mat (a prayer mat with prayer monitoring system) was developed to assist elderly people, who can forget the sequence of daily prayer through keeping track of and counting the cycles of each daily ritual prayer (Jamal, 2010).

Both of the previously developed prayer rugs are suitable to use at home due to the heaviness and thickness of these rugs. In contrast, the current study focused on developing the functional aspect of individual portable prayer rugs, which have less weight and thickness to be suitable for travelling and carrying around in order to facilitate the obligatory daily ritual prayers.

Second, one of the previous studies focused on examining the ergonomic aspect of the prayer rug utilized the experimental approach for both male and female consumers (Huffington Post, 2013). However, the current research utilized a survey approach to examine specifically the female Muslim consumers' preferences regarding the FEA factors of the digitally-printed portable prayer rug (Lamb & Kallal, 1992). Using a survey method consumed less time and effort to evaluate the prayer rug as a product compared to the experimental approach that was used for the other study, yet it gave a contribution to the literature associated with female Muslim consumers and their purchase behavior in general, and their purchase preferences of digitally-printed portable prayer rugs in particular.

### *Practical Implications*

There are multiple practical implications for this research. The primary implication of this research is using this work as a foundation to increase the portable prayer rug industrial sector in developing Islamic countries through establishing a business plan with social enterprise (fair trade enterprise), as a reflection of increasing interest in ethical production and consumerism, particularly in the area of education for women and the poor.

As mentioned in the literature, there are strong links between fair trade as a social enterprise model and the improvement of the quality of life for people in poverty. Littrell and Dickson (2010) supported this concept as they defined fair trade enterprises "as a set of socially responsible practices that include paying a fair wage in the local context, offering equitable

employment opportunities among workers, providing healthy and safe working conditions, promoting environmental sustainability, offering business and technical training" (p. 3). Also, fair trade considered as "a social movement that aims to set fair prices for products, alleviate poverty, and assist producers marginalized by a traditional economic model" (White and colleagues, 2012, p. 103). Therefore, the business sector and nongovernmental organizations in some developing countries have moved toward finding solutions to enhance the quality of life of women in poverty (Tutolo, 2011). In Saudi Arabia for example, through the Jameel programs of corporate social responsibility (CSR) in the private sector, individual home prayer rugs are produced.

There are a lot of social enterprises as nongovernmental organizations, which have produced multiple products to improve the life quality of poor people, and there are many other products that have yet to be produced. One of these products is the portable prayer rug. The digitally-printed portable prayer rug developed in this research might be designed and produced in Middle Eastern countries, and could be promoted as an ethically socially responsible/fair trade product. It is conceivable that a new start-up business in the form of a social enterprise/fair trade enterprise to help low-income Muslim women improve the quality of their life based on producing digitally-printed portable prayer rugs might be applied to any of the developing Islamic countries. This could potentially increase the number of industrial products and result in an improved economy.

This work has been recognized as a good opportunity to have a positive impact on the world. For instance, one of the eight digitally-printed portable prayer rug designs received the Global Impact-Creative Award (Global Artistry and Creativity) at the Graduate Showcase (Celebrate Research and Creativity conference) at CSU, Fort Collins, CO, November 2015. This

award connected the creativity of the product and the opportunity to improve the life quality of poor people in the world (Graduate Student Showcase, 2015) (see Figure 5.1).

Finally, based the statistical findings, the major two approaches to promote the digitally-printed portable prayer rugs successfully to Muslim consumers at the Islamic market are:

1. Focusing on the functional and expressive values of the digitally-printed portable prayer rugs to market these rugs.
2. Focusing on promoting digitally-printed portable prayer rugs as a strategy to help other low-income Muslim women to improve their living conditions through providing employment opportunities for them to work on assembling the digitally-printed portable prayer rugs.





Figure 5.1 – Global Impact Award (Global Artistry and Creativity)

## **Limitations**

The most significant limitation for this study was the limited number of Muslim women represented (sample obtained in Colorado), which led to less variation in characteristics such as culture and background, socioeconomic demographic status. Thus, the preferences of digitally-printed portable prayer rugs could be affected by presenting different cultures and backgrounds. Another possible concern related to the number of participants in the present study is that the number of participants were limited to only female Muslims who attended the Islamic Center of Fort Collins (ICFC) frequently.

The second limitation was using flyer and snowball techniques. The flyer technique was the main technique to inform Muslim women who live in Fort Collins, CO about the study, which was a limitation. Consequently, the researcher used snowball sampling as an additional technique to inform more participants about the study and increase the sample size because it was very difficult to locate Muslim females who live in Colorado. Thus, the generalizability of the study is limited due to the restricted sample size  $N=50$  for the survey and geographic location.

The third limitation was time restraints on the study, which may have affected the number of participants who were able to participate in the study. For example, the researcher selected Friday nights to meet with the participants at the Islamic Center of Fort Collins, between 7-9 pm to collect the data. The researcher selected that date and time based on the peak time at the Islamic Center of Fort Collins, as the (ICFC) provides after the sunset prayer on Friday night for different religious classes for both women and children. Thus, during the time described previously the Islamic Center of Fort Collins had to have the maximum number of attendees. However, some of the participants could participate in the focus group session, but by the time to

fill the survey they had to leave in order to attend the religious classes that were provided by the Islamic Center for females.

The fourth limitation regarding this research was the inclusion criteria, which were participants who are adults 18 years of age and older, participants who speak and read English language, and developing the questionnaire in English. These criteria had both positive and negative aspects. On the one hand, the positive side was facilitating the process of collecting the data. On the other hand, there were females who were under 18 years (13-17 years/ teenagers) or who only spoke Arabic. Those females were interested to be a part of the study and to give their opinions through evaluating the digitally-printed portable prayer rugs, but unfortunately the researcher had to exclude them.

### **Recommendations for Future Research**

The present study has opened up many opportunities for further inquiry. This work focused upon female Muslim consumer purchase preferences of digitally-printed portable prayer rugs. However, men also purchase and use portable prayer rugs, and as such, it will be important to explore how men's preferences of digitally-printed portable prayer rugs might differ from women's preferences. Additionally, it would be valuable to duplicate this research to examine the effect of country differences on the consumer purchase preferences of digitally-printed portable prayer rugs.

Further developments on the functionality of the digitally-printed portable prayer rugs could include laboratory coating experiments to increase the durability of these rugs and add more features to them, such as adding the water-proof feature and stain resistant feature. These features in regards to durability had been recommended by one of the participants as an additional advancement to the digitally-printed portable prayer rug.

*“I recommend making both sides of the prayer rug water proof.”* (Participant 49)

Further research could be equipping the digitally-printed portable prayer rugs with a compass. An emphasis of the previous notion was expressed by some of the participants.

*“I suggest adding a compass.”* (Participant# 11 and 22)

The previous quote showed that the participant recommended including a compass with the digitally-printed portable prayer rug to help them to find the direction of Mecca.

Further study could be conducted to examine the durability of the digital images printed onto the portable prayer rugs and measure the life span of those rugs including utilization and laundry process. Standard textile testing measures could be used to evaluate the abrasion that might happen to the printed image during the utilization of the prayer rug and assess the colorfastness of the digital print after laundering the prayer rug for several times.

Finally, in terms of replicating this study, the researcher suggests to include a use experience, which would allow the participant to give an experiential evaluation of the digitally-printed portable prayer rug through reporting their experience of using the product for several times or days to measure their satisfaction with these rugs. Another suggestion regarding the replication of this study, the researcher suggests using the human factors theory (Green & Jordan 1999) as another framework to evaluate the digitally-printed portable prayer rugs. More specifically, examining the pleasure aspects that might be associated with the digitally-printed portable prayer rugs as a product. According to Green and Jordan (1999), any product can give its user different types of pleasure such as physio-pleasure, socio-pleasure, psycho-pleasure, and ideo-pleasure and these four pleasure types are considered to be the new framework for looking at human factors during the process of product development. Certainly, findings from such inquiries would have implications for gaining a deeper understanding about the Muslim

consumers' preferences in regards to an essential daily-use Islamic product like prayer rugs in order to meet their wants and needs.

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APPENDIX A  
SURVEY INSTRUMENT

**Consumer Survey of Portable Prayer Rug Use**

**I. About yourself:** Please answer the following questions about yourself and your shopping behavior.

1. What is your age? \_\_\_\_\_
2. What is your nationality? \_\_\_\_\_
3. What is your marital status?  
 Single    Married    Married with kids    Divorced
4. What is your occupation?  
 Part time employed    Full time employed    Student    Homemaker
5. What is your monthly household income?  
 Below \$1,000    \$1,001 to \$1,500    \$1,501 to \$2,000    \$2,001 to \$2,500  
 More than \$2,500
6. In general, do you own a portable prayer rug for yourself? If so, how many? \_\_\_\_\_  
 None    1    2-3    4-5    More than 5
7. How often do you usually purchase a new prayer rug?  
 Rarely    once several years    once a year    several times a year    once a month
8. On average, how much do you usually spend on buying a prayer rug? \$ \_\_\_\_\_
9. What is the primary reason for you to purchase a new prayer rug?  
 For gifts    For guests    For myself    Other, please specify: \_\_\_\_\_
10. When purchasing a new prayer rug, what is most important to you? (Please check all that apply.)  
 Design (e.g., colors, motifs)    Portability    Price    Quality    Thickness of the rug  
 Other, please specify: \_\_\_\_\_
11. How do you usually dispose of your old prayer rugs? (Please check all that apply.)  
 Donate it    Toss it    Recycle it    Reuse it for other purposes    Put it aside in storage  
 Give it to family/friends    Other, please specify:  
 \_\_\_\_\_

**II. Your perceptions.** Please indicate your degree of agreement with the statements shown below.

Questions	Strongly Disagree		Neutral			Strongly Agree	
1. Using this prayer rug would be comfortable.	1	2	3	4	5	6	7
2. Using this prayer rug would be helpful.	1	2	3	4	5	6	7
3. The weight of this prayer rug would be easy to carry.	1	2	3	4	5	6	7
4. The thickness of this prayer rug would give me enough protection from scratching myself on the floor.	1	2	3	4	5	6	7
5. The length and width of the portable prayer rug would be sufficient to kneel on.	1	2	3	4	5	6	7



Questions	Strongly Disagree			Neutral			Strongly Agree
6. The folded size of the portable prayer rug would fit in my purse or backpack.	1	2	3	4	5	6	7
7. The attached foldable case of the portable prayer rug would be useful.	1	2	3	4	5	6	7
8. The incorporation of the <i>Kabah</i> in the design of the portable prayer rug would influence my purchase decision.	1	2	3	4	5	6	7
9. This portable prayer rug would be more compatible with my needs than the portable prayer rug(s) I already have.	1	2	3	4	5	6	7
10. This portable prayer rug would be appropriate for my lifestyle.	1	2	3	4	5	6	7
11. The appearance of the portable prayer rug is aesthetically appealing to me.	1	2	3	4	5	6	7
12. The color of the portable prayer rug matches my favorite color(s).	1	2	3	4	5	6	7
13. The use of Islamic ornamentations to decorate/embellish the surface of portable prayer rugs is aesthetically appealing to me.	1	2	3	4	5	6	7
14. The color schemes are aesthetically appropriate for a prayer rug.	1	2	3	4	5	6	7

**III. Evaluations of the Eight Prayer Rugs.** Please indicate your preferences by circling the number that best describe your opinion for each prayer rug on the following aspects: a) color, b) level of complexity of the design, and c) drawing (design of Islamic ornamentations).

		Design Elements						
		Least preferred						Most preferred
Design #1	Color	1	2	3	4	5	6	7
	Drawing (Design of Islamic ornamentations)	1	2	3	4	5	6	7
	Level of complexity of the design	1	2	3	4	5	6	7
	Color	1	2	3	4	5	6	7
Design #2	Drawing (Design of Islamic ornamentations)	1	2	3	4	5	6	7
	Level of complexity of the design	1	2	3	4	5	6	7
	Color	1	2	3	4	5	6	7
	Drawing (Design of Islamic ornamentations)	1	2	3	4	5	6	7
Design #3	Level of complexity of the design	1	2	3	4	5	6	7
	Color	1	2	3	4	5	6	7
	Drawing (Design of Islamic ornamentations)	1	2	3	4	5	6	7
	Level of complexity of the design	1	2	3	4	5	6	7

<b>Design #4</b>	<b>Color</b>						
	1	2	3	4	5	6	7
	<b>Drawing (Design of Islamic ornamentations)</b>						
	1	2	3	4	5	6	7
	<b>Level of complexity of the design</b>						
	1	2	3	4	5	6	7
	<b>Color</b>						
	1	2	3	4	5	6	7
<b>Design #5</b>	<b>Drawing (Design of Islamic ornamentations)</b>						
	1	2	3	4	5	6	7
	<b>Level of complexity of the design</b>						
	1	2	3	4	5	6	7
<b>Design #6</b>	<b>Color</b>						
	1	2	3	4	5	6	7
	<b>Drawing (Design of Islamic ornamentations)</b>						
	1	2	3	4	5	6	7
	<b>Level of complexity of the design</b>						
	1	2	3	4	5	6	7
	<b>Color</b>						
	1	2	3	4	5	6	7
<b>Design #7</b>	<b>Drawing (Design of Islamic ornamentations)</b>						
	1	2	3	4	5	6	7
	<b>Level of complexity of the design</b>						
	1	2	3	4	5	6	7
<b>Design #8</b>	<b>Color</b>						
	1	2	3	4	5	6	7
	<b>Drawing (Design of Islamic ornamentations)</b>						
	1	2	3	4	5	6	7
	<b>Level of complexity of the design</b>						
	1	2	3	4	5	6	7

Please evaluate the eight prayer rugs and provide your feedback regarding your degree of agreement based on the statement below.

**The motifs that are used to depict the *mihrab* in the portable prayer rug represent the atmosphere of the mosque.**

	<b>Strongly Disagree</b>		<b>Neutral</b>			<b>Strongly Agree</b>	
<b>Design #1</b>	1	2	3	4	5	6	7
<b>Design #2</b>	1	2	3	4	5	6	7
<b>Design #3</b>	1	2	3	4	5	6	7
<b>Design #4</b>	1	2	3	4	5	6	7
<b>Design #5</b>	1	2	3	4	5	6	7
<b>Design #6</b>	1	2	3	4	5	6	7
<b>Design #7</b>	1	2	3	4	5	6	7
<b>Design #8</b>	1	2	3	4	5	6	7

**IV. Attitude.** Please circle the number that best describes your opinion.

To me, purchasing digitally printed portable prayer rug is ...

<b>Bad</b>	1	2	3	4	5	6	7	<b>Good</b>
<b>Unfavorable</b>	1	2	3	4	5	6	7	<b>Favorable</b>
<b>Foolish</b>	1	2	3	4	5	6	7	<b>Wise</b>

**V. Purchase Intention.** Please indicate your degree of agreement with the statements shown below.

Questions	Strongly Disagree		Neutral			Strongly Agree	
	1	2	3	4	5	6	7
1. I intend to try this type of prayer rug.	1	2	3	4	5	6	7
2. It is likely that I will buy this prayer rug when it becomes available.	1	2	3	4	5	6	7
3. I would purchase this prayer rug.	1	2	3	4	5	6	7
4. This prayer rug as an ethical and socially responsible product would influence my purchase decision.	1	2	3	4	5	6	7
5. This prayer rug as an environmentally friendly product would influence my purchase decision.	1	2	3	4	5	6	7
6. If I knew that the money from purchasing this prayer rug went to low-income women who made the rug that would influence my purchase decision.	1	2	3	4	5	6	7

Please check the amount of money that you are willing to pay for this prayer rug?

Less than \$30    \$31-\$40    \$41-\$50    \$51-\$60    \$61-\$70    Other: \_\_\_\_\_

Are there any additional thoughts and comments about the portable prayer rug that you would like to share with us?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*Your contribution to this research is greatly appreciated.  
Thank you very much for completing the survey!*

APPENDIX B  
PARTICIPANT CONSENT FORM

**Consent to Participate in a Research Study  
Colorado State University**

**TITLE OF STUDY:** Female Muslim consumer purchase preferences of digitally printed portable prayer rugs

**PRINCIPAL INVESTIGATOR:** Diane Sparks, 320 Gifford, Colorado State University, Fort Collins, CO 80523-1574. Phone: 970.491.5360. Email [diane.sparks@colostate.edu](mailto:diane.sparks@colostate.edu)

**CO-PRINCIPAL INVESTIGATOR:** Maram Altilmisani, Colorado State University, Fort Collins CO 80523-1574. Phone: 970.690.4973. Email: [maram.altilmisani@hotmail.com](mailto:maram.altilmisani@hotmail.com)

**WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH?** As a female Muslim at Colorado State, you are invited to participate in the research project. Information obtained from the survey and the focus group discussion will help enhance knowledge about female Muslim consumer purchase preferences of digitally printed portable prayer rugs.

**WHO IS DOING THE STUDY?** I am a researcher at Colorado State University. I am also a Professor of the Department of Design and Merchandising.

**WHAT IS THE PURPOSE OF THIS STUDY?** The purpose is to explore female Muslim consumer preferences related to digitally-printed portable prayer rugs in the context of the FEA consumer needs model.

**WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?** Focus group discussions will take place in the Islamic center of Fort Collins building and will last for 60 minutes. Focus groups will take place in the year of 2016.

**WHAT WILL I BE ASKED TO DO?** If you decide to participate in this research, you will join a focus group discussion moderated by the Co-Principal Investigator. During the focus group discussion, the researcher will show you the features of the portable prayer rugs, and then you will be able to see all the eight digitally printed portable prayer rugs, touch them and feel them. Later, you will be asked to answer the survey questions related to your purchase preferences of digitally printed portable prayer rugs.

**ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY?** You should participate in this study only if you are a female Muslim who needs a portable prayer rug in order to facilitate your daily prayers, who has used or purchased a portable prayer rug at least once in the last two years.

**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 understanding about their wants, needs, and preferences in an essential Islamic daily product such as a portable prayer rug, and learn how their purchasing preferences of digitally printed portable prayer rug will contribute to the literature associated with female Muslim consumers behavior in general.

**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?** My research assistant and I will keep private all research records that identify you, to the extent allowed by law. The CSU IRB also has the authority to access the research files.

CSU#: 059-17H  
APPROVED: 2/29/2016 \* EXPIRES: 2/28/2019

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

I 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, I will assign a numeric code (e.g., "Participant 1") to the survey of your focus group participation. Your name will be kept separate from your research records (e.g., survey) 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 focus group without penalty. You may be removed from the study if you do not fully complete the questionnaire.

**WILL I RECEIVE ANY COMPENSATION FOR TAKING PART IN THIS STUDY?** Yes. You will receive compensation in the form of free \$ 10.00 gift card after completing the questionnaire and finishing the focus group session.

**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. Diane Sparks at 970.491.5360. 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 survey and relevant documents file will be destroyed in 2019. Do you give your permission for us to participate in this research?

**YES  NO**  I certify that I have read and understand the above information. I freely and voluntarily give my consent to participate in the research project entitled "Female Muslim consumer purchase preferences of digitally printed portable prayer rugs". I understand my responses will be kept confidential in a secure facility and that they will be destroyed by 2019.

*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

CSU#: 059-17H  
APPROVED: 2/29/2016 \* EXPIRES: 2/28/2019



APPENDIX C  
HUMAN SUBJECT'S FORM



Research Integrity & Compliance Review Office  
Office of Vice President for Research  
Fort Collins, CO 80523-2011  
(970) 491-1553  
FAX (970) 491-2293

**Date:** February 29, 2016

**To:** Diane Sparks, Ph.D., Design & Merchandising  
Maram Altimisani, Design & Merchandising

**From:** IRB Coordinator, Research Integrity & Compliance Review Office  
(RICRO\_IRB@mail.colostate.edu)

**Re:** Female Muslim Consumer Purchase Preferences of Digitally Printed Portable Prayer Rugs

**IRB ID:** 059 -17H      **Review Date:** February 29, 2016  
**This project is valid from three years from the review date.**

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The Institutional Review Board (IRB) Coordinator has reviewed this project and has declared the study exempt from the requirements of the human subject protections regulations with conditions as described above and as described in [45 CFR 46.101\(b\)](#):

Category 2 - Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

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The IRB determination of exemption means that:

- **This project is valid for three years from the initial review.** After the three years, the file will be closed and no further research should be conducted. If the research needs to continue, please let the IRB Coordinator know before the end of the three years. You do not need to submit an application for annual continuing review.
- You must carry out the research as proposed in the Exempt application, including obtaining and documenting (signed) informed consent if stated in your application or if required by the IRB.
- Any modification of this research should be submitted to the IRB through an email to the IRB Coordinator, prior to implementing any changes, to determine if the project still meets the Federal criteria for exemption.
- Please notify the IRB Coordinator (RICRO\_IRB@mail.colostate.edu) if any problems or complaints of the research occur.

Please note that you must submit all research involving human participants for review by the IRB. **Only the IRB or designee may make the determination of exemption**, even if you conduct a similar study in the future.

APPENDIX D

RECRUITMENT LETTER TO THE ISLAMIC CENTER OF FORT COLLINS

Dr. Diane Sparks  
320 Gifford  
Colorado State University  
Fort Collins, CO 80523-1574

March, 2016

Dear Dr. Sparks:

I have reviewed the information regarding your research project, "**Female Muslim consumer purchase preferences of digitally printed portable prayer rugs.**" I am familiar with the scope of the project and understand that attendees in the Islamic center of Fort Collins are adequately protected as human research subjects and their participation is completely voluntary. Therefore, I would like to share the information with attendees in the Islamic center of Fort Collins. In order to encourage their participation, participants who take the survey will be able to receive \$10 gift card after fully completing the survey and the focus group session.

Please do let me know if you have any questions.

Sincerely,

Islamic Center of Fort Collins

APPENDIX E

FOCUS GROUP RECRUITMENT POSTER

# Portable Prayer Rugs

## Participants Needed For Research Focus Group

- Who:** Any Female Muslims 18+ who use prayer rugs
- What:** A focus group will be led by the researcher that consists of discussion and survey on consumer purchase preferences of portable prayer rugs
- Duration:** Approximately 60 minutes
- Where:** The Islamic Center of Fort Collins
- When:** On a Friday night sometimes between 7-9 pm

**\$10 Gift Card for Your Participation!**

Please Contact Maram Altilmisani at  
[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu) If Interested

Portable Prayer Rugs Focus Group  
Contact Maram Altilmisani at  
[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu)

Portable Prayer Rugs Focus Group  
Contact Maram Altilmisani at  
[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu)

Portable Prayer Rugs Focus Group  
Contact Maram Altilmisani at  
[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu)

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[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu)

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Contact Maram Altilmisani at  
[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu)

Portable Prayer Rugs Focus Group  
Contact Maram Altilmisani at  
[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu)

Portable Prayer Rugs Focus Group  
Contact Maram Altilmisani at  
[mmtilmis@mail.colostate.edu](mailto:mmtilmis@mail.colostate.edu)



APPENDIX F  
VERBAL RECRUITMENT

**VERBAL RECRUITMENT/CONSENT TEMPLATE: No Identifiers Collected**

In conversational style, ...

Hello, my name is (Maram Altilmisani) and I am the Co-Principal Investigator from Colorado State University in the Department of Design and Merchandising. We are conducting a research study on exploring female Muslim consumer preferences related to digitally-printed portable prayer rugs in the context of the FEA consumer needs model. The title of our project is *Female Muslim consumer purchase preferences of digitally printed portable prayer rugs*. The Principal Investigator is Diane Sparks and I am the Co-Principal Investigator in the same department.

We would like to invite you to participate in a focus group discussion. Participation will take approximately *60 minutes*. Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participation at any time without penalty.

Would you like to participate?

If yes: The focus group will be held at (7:00-8:00 pm /March 11, 2016/at the Islamic center of Fort Collins). We will see you at the meeting.

If no: Thank you for your time.

We will not collect your name or personal identifiers. When we report and share the data with others, we will combine the data from all participants. There are no known risks or direct benefits to you, but we hope to gain more knowledge on female Muslim consumer preferences related to digitally-printed portable prayer rugs.

Please contact me (Maram Altilmisani) at [maram.altilmisani@hotmail.com](mailto:maram.altilmisani@hotmail.com) if you have any questions about the study. If you have questions about your rights as a volunteer in this research, contact the CSU IRB at: [RICRO\\_IRB@mail.colostate.edu](mailto:RICRO_IRB@mail.colostate.edu); 970-491-1553.

APPENDIX G

INSTRUCTIONS FOR FOLDING THE DIGITALLY-PRINTED PORTABLE PRAYER RUGS

Instructions for folding the digitally-printed portable prayer rug



1



2

Instructions for folding the digitally-printed portable prayer



3



4



5



6



7



8



9

APPENDIX H  
PROPOSAL APPROVAL FORM



**Master's Proposal Approval  
Department of Design and Merchandising**

PROPOSAL TITLE/TOPIC

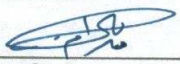

**FEMALE MUSLIM CONSUMER PURCHASE PREFERENCES FOR DIGITALLY PRINTED PORTABLE PRAYER RUGS**

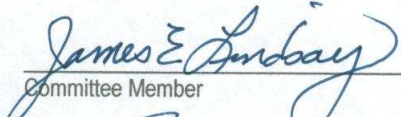

This form must accompany the proposal and be completed for the proposal to be accepted. Acceptance must be made prior to collection of data and no later than the term before planned completion of the degree. Any conditions related to the acceptance of the proposal are to be listed prior to the signing. This includes filing for and receiving approval from the Committee on Human Research to study human subjects.

CONDITIONS:

COMMENTS/RECOMMENDATIONS/ADDITIONAL COURSES REQUIRED:

SIGNATURES:

	2-17-16
_____ Graduate Student	Date
	2-17-16
_____ Adviser	Date
_____	2-17-16
Co-Adviser	Date

	2-17-16
_____ Committee Member	Date
	2-17-16
_____ Committee Member	Date
_____	_____
DM Graduate Coordinator	Date

DISTRIBUTION: Student  
Adviser  
Committee Members  
Department Records

Attach Copy of Proposal