Development of innovative knot combinations designs
Using macramé technique

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Abstract
Macramé is a type of textile-making using knots and hitching. Macramé uses all types of cords and threads depending on the type of object, including yarn, floss, hemp, linen, wire, and polypropylene. Macramé is fun, creative, and perfect for keeping restless hands occupied. It is a wonderful way of expressing creativity, personal style and individuality by creating designs through combinations of knots. Macramé can be used to make all sorts of household items, not to mention ornaments, decorations, and accessories. This study is an attempt to develop innovative knot combination designs through Macramé technique and create a new line of designs for the designers’ inspiration. Samples of ten selected Macramé knots i.e. overhand knot, half hitch knot, double half hitch knot/cording, alternative half hitch knot, half knot, flat knot, popcorn knot, reverse cording, double chain knot with four ends and Josephine knot were prepared using selected cord. Preferences of experts were sought for prepared knots using self-structured preferential choice index. On the basis of weighted mean score, top preferred five Macramé knots i.e. double half hitch knot, half knot, flat knot, popcorn knot and reverse cording knot were selected for development of knot combination designs. Total twenty designs were developed using the selected knots in different combinations. Results of preferences of experts for knot combination designs inferred that most preferred knot combination designs were Design No. 14 (WMS 2.93), 7 (WMS 2.86), 10 (WMS 2.73), 16 (WMS 2.67) and 18 (WMS 2.63).

Keywords: Macramé, knot, knot combination, designs, textile designing

Introduction
Throughout history, art has served as a means of decoration and individual expression. The urge for decorating immediate surroundings has remained constant and enchanted in the mind and soul throughout the ages like a spell. Creativity is the process of bringing something new into being and requires passion and commitment. Creativity is typically seen as the basis for innovation which is the successful implementation of creative ideas within an organization. For design creation one must have a strong sense of the aesthetic eye for colour and detail, a sense of balance and proportion and an appreciation for beauty. Designers are one of the main key of fashion and textile world as they keep the fashion moving in textile and apparel industry to bring new trends and designs for interiors (upholstery, soft furnishings, carpets and curtains) and secondly, fabrics for clothing (Raaaz, 2013) [6]. India is a manufacturing hub of various handicrafts, which are popular even in international markets. The most known form of handicrafts in India are bamboo, cane, metal, bone and horn, brass, wood, clay, jute, paper, rock, shell, weaving, embroidery and Macramé (Joseph et al., 2011) [5]. Macramé is a form of textile-making by series of knots. Macramé is an Arabic word, signifying an ornamental fringe or trimming, which has been adopted as the term for a certain kind of hand-work that also known as knotted fringe or Mexican lace (Dillmont, 2007) [3]. Macramé knots are widely used in designing items ranging from utility to decoration, furnishing or accessories. Different knot combinations through Macramé are used to prepare attractive and beautiful products (Jonathan et al., 2015) [4]. In this era of ever changing demand for newer fashion, there is a need to revive and modify the old craft in contemporary form. The best way to revive an art form is to make it contemporary and competitive with the existing styles or techniques of manufacturing. This study is an attempt to develop distinct designs of Macramé knot technique and create a new line of designs for the designers’ inspiration. Thus, the present study was conducted to with an
objective to develop innovative knot combination designs using Macramé technique.

Materials and Methods: The present study was conducted in the Department of Textile and Apparel Designing, I.C. College of Home Science, CCS Haryana Agricultural University, Hisar.

Selection of cord: Eighty seven cords were collected from markets of Hisar and Panipat city of Haryana state and from different markets of Delhi. Out of collected eighty seven cords, fifty cords were screened as per their suitability for Macramé technique as well as for partition curtains. For selection of cord and colour of cord preferences of thirty experts were sought on three point continuum scale using preferential choice index. Weighted mean scores were calculated and on the basis of weighted mean score, one most preferred cord and colour of cord was selected.

Preparation and selection of Macramé knots: Ten samples of 5” length were prepared using selected cord and ten different Macramé knots i.e. overhand knot, half hitch knot, double half hitch knot/cording, alternative half hitch knot, half knot, flat knot, popcorn knot, reverse cording, double chain knot with four ends and Josephine knot. Prepared samples of Macramé knots were subjected to final selection by the experts. Preferences of respondents were sought on three point rating scale i.e. highly preferred, preferred and least preferred. On the basis of weighted mean scores, ranks were assigned and five top preferred knots were selected for development of knot combination designs.

Preparation and selection of knot combination designs: The selected Macramé knots were used for design development with all possible combinations, hence twenty samples of knot combination designs of size 3”x4” were prepared for selection of knot combination designs. To know the preferences of experts regarding developed knot combination designs preferential choice index was developed. On the basis of preferences of experts top ranked five knot combination designs were selected for further work.

Results and Discussion
Preparation of Macramé knots: Ten samples of different Macramé Knots i.e. overhand knot, half hitch knot, double half hitch knot/cording, alternative half hitch knot, half knot, flat knot, popcorn knot, reverse cording, double chain knot with four ends and Josephine knot were prepared using selected cord and presented in Plate-1.

Selection of Macramé knots: The developed knot samples were got evaluated by a panel of thirty experts and results obtained are presented in Figure 1. The data reveal that most preferred knot was double half hitch knot scoring highest weighted mean score (2.83) and ranked I followed by half knot (2.67) ranked II, flat knot (2.63) ranked III, popcorn knot (2.57) ranked IV and the reverse cording knot was assigned rank V scoring (2.40).
The declined trend in preferential choices of experts for rest of the knots as double chain knot with four ends (2.37), Josephine knot (2.30), overhand knot (2.23), alternative half hitch knot (2.17) and half hitch knot scored lowest (1.83). Hence, double half hitch knot/cording, half knot, flat knot, popcorn knot and reverse cording knot were selected for further work. Anuar and Daud (2011) [2] also selected four knots from several Macramé knots which includes two basic knots i.e. half hitch knot and the square knot. The other two most common and versatile knots were overhand knot and Josephine knot.

**Fig 1:** Experts’ preferences for Macramé knots

**Development of Macramé knot combination designs:** For developing innovative Macramé knot combination designs, the selected five Macramé knots i.e. double half hitch knot/cording, half knot, flat knot, popcorn knot and reverse cording knot were used in different combinations. Twenty designs of Macramé knot combinations were developed. The developed knot combination designs are presented in Plate-2.

**Plate 2:** Macramé Knot Combination Designs

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Selection of macramé knot combination designs: All the developed designs of knot combinations were assessed by a panel of thirty experts and preferential choices for created knot combination designs are presented in Figure 2. The data reveal that amongst all the prepared knot combination designs, Design No. 14 prepared by combining knot number 3 (double half hitch knot), 5 (half knot) and 6 (flat knot) was most preferred by the experts scoring highest i.e. 2.93 and ranked I followed by Design No. 7 prepared by combining knot number 3 (double half hitch knot), 5 (half knot) and 6 (flat knot) scoring 2.86 at rank II. Knot combination Design No. 10 prepared by combining knot number 3 (double half hitch knot), 5 (half knot) and 6 (flat knot) scored 2.73 at rank III, Design No. 16 prepared by combining knot number 3 (double half hitch knot), 6 (flat knot) and 7 (popcorn knot) scored 2.67 at rank IV and Design No. 18 prepared by combining knot number 3 (double half hitch knot) and 6 (flat knot) scored 2.63 at rank V.

Fig 2: Experts’ preferences for developed Macramé knot combinations designs

The other knot combination designs obtained descending order of preferences were Design No. 11 (2.60), 5 (2.56), 4 (2.53), 8 (2.46), 2 (2.43), 17 (2.40), 13 (2.35), 6 (2.32), 15 (2.27), 3 (2.24), 20 (2.20), 9 (2.18), 1 (2.10), 19 (2.03) and Design No. 12 was ranked XX scoring 1.90. It is thus found that five top preferred Macramé knot combination designs were Design No.14, 7, 10, 16 and 18 (Plate-3).

Table 3: Selected Macramé Knot Combination Designs

<table>
<thead>
<tr>
<th>Design Number</th>
<th>Rank</th>
<th>Weighted Mean Score</th>
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<tbody>
<tr>
<td>14</td>
<td>I</td>
<td>2.86</td>
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<tr>
<td>7</td>
<td>II</td>
<td>2.73</td>
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<td>16</td>
<td>IV</td>
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<td>18</td>
<td>V</td>
<td>2.63</td>
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Conclusion

Hence to conclude, the execution of this study revealed that the best Macramé knots were picked and were artistically combined to form designs. Design number 14, 7, 10, 16 and 18 developed using knot number 3 (double half hitch knot), 5 (half knot), 6 (flat knot) and 7 (popcorn knot) were found highly preferred for development of Macramé products. To satisfy the urge of high-end consumers as well as designers’ own need of creating something new and creative, Macramé technique have endless possibilities for combining different knots artistically to create designs for apparels, textiles and utility articles.

References