

Acceptability of corn *zea mays* husk fiber as raw material in fabric making

Marcela M. Bungag

Faculty of Garments Fashion and Design, Technology Department, Marikina Polytechnic College

ARTICLE INFORMATION

Article History:

Received: August 3, 2017

Received in revised form: June 19, 2018

Accepted: July 27, 2018

Keywords:

Acceptability, corn husk fiber, fabric

**Corresponding author: Marcela M. Bungag
(marcelabungag75@gmail.com)*

ABSTRACT

*This study attempted to determine the acceptability of corn *Zea mays* husk fiber as raw material in making new fabric. The study used the experimental and descriptive methods of research. It was evaluated by 10 Fashion Designers/Boutique Owners from Marikina, 10 Professors and 97 3rd year and 4th year Garments Fashion and Design (GFD) students from Marikina Polytechnic College using the 5-point Likert Scale. The research instrument used is the survey-questionnaire and was personally administered by the researcher. The data gathered was tallied and statistically treated using the weighted mean and analysis of variance (ANOVA). Results indicated that there is no significant difference in the evaluation of the three groups of respondents on the acceptability of corn husk fiber as new fabric with regards to usefulness, durability, appearance and eco-friendliness. The study found out that corn husk fabric is very useful but the texture is rough; an excellent idea in addition to our indigenous fabrics in our country, but there is a need to improve the texture to become locally competitive or world class fabric; it can also be used in making curtains and household storage with additional trimmings like embroidery, patchwork and beadwork; using of corn husk in making fabric is a brilliant idea and good discovery, and the product can be used to start a business.*

Introduction

Corn is considered a staple food of the Filipino especially in the provinces. The husk or the outer shell (coating of the corn) prevents seed dispersal by wind, birds, or other natural means. Since the husk encloses all the kernel, or seeds, the dispersal of the kernel is only reliant on humans who remove it from the husk. Apparently, corn husk is useless because it cannot be eaten nor transformed into a drink, thus humans consider corn husk as a scum or thrash. Since humans do not appreciate any value from corn husks, these are thrown in rivers or bodies of water that cause clogging and flooding affecting properties and people as well.

According to Agriculture Horticulture protect (vegetables/soil), in recent years, husk crops offer opportunities for improving soil quality and crop species and management. It is for this reason that the researcher conducts this study to have an idea on what people can do to corn husk for it to be useful and make it an eco-friendly product that will help not only the industry but also the environment.

Meanwhile, the fashion industry is one of the most dynamic fields today; it has been growing and expanding throughout the years, and as the market grows and evolves, customers need to become more specific and unique. This trend has been a challenge for the manufacturers and the people behind the fashion industry: to cater and provide products that will satisfy the ever-changing market. For the country's part, the Philippine textile and apparel industry aims to raise its competitiveness in the world market through product development (Thomasson, 2013).

The Philippine garments and apparel industry has always been among the world's largest, with most items being produced out of developing countries. In 2000, the industry breached the three-billion dollar

mark (Garments and Textile Export Board, 2016). Meanwhile, the fashion market in general has been characterized with several changes for the past decades and fashion companies doing organization, planning and performing their new product development process (Bandinelli, et. al., 2013). New product development is a significantly dynamic process in the industry; it is characterized by high seasonal demand, which depends on the seasonal nature of fashion products. Usually, the entire product development process runs at least twice a year, once for each season and a short amount of time to market, this is about 15 months for apparel industry (Bandinelli, Rinaldi, Rossi & Terzi, 2013).

Within the phase of product development, several product revisions occur especially with interactions among designers, stylists and marketing functions. These changes in the phase of product development happen in order to re-arrange and re-align the company's or the brands product in accordance with the customer demands (Bandinelli et. al., 2013).

By using the corn husk fiber, the researcher attempts to produce a fabric that can also compete with the other native fabrics here in the Philippines like piña fabric, water hyacinth fabric, coconut husk fabric and many others. This corn husk fabric will support, promote and encourage the growth and development of native products in the Philippines.

Purposes of the Research

This study attempted to determine the acceptability of corn *Zea mays* husk fiber as raw material in making fabric. It aimed to answer the following questions: (1) How can corn *Zea mays* husk fiber be used or developed into new fabric? (2) How do the three groups of respondents perceive the level of acceptability of the developed/

produced fabric in terms of: a) usefulness; b) durability; c) appearance; and d) eco-friendliness?, and; (3) Is there a significant difference in the evaluation of the three groups of respondents on the acceptability of corn *Zea mays* husk fiber as fabric?

Methodology

Research Design

The study used the experimental and the descriptive method of research. An experimental method was utilized to determine the acceptability of the developed corn *Zea mays* husk fabric. According to Gay, L.R. (1987), experimental method of research is guided by a hypothesis (or several hypotheses) that states an expected relationship between two or more variables. Experimental research, although very demanding of time and resources, often produces the soundest evidence concerning hypothesized cause-effect relationships (Gay, 1987). For this study, the expectation is that there is no significant difference on the evaluation of the fabric by the different group of respondents which would entail the acceptability of the developed fabric. The study also used the descriptive method of research to determine the perceptions of the three groups of respondents on the level of acceptability of the developed/produced fabric. This method is appropriate to use since the study aims to determine the present status of the developed fabric in terms of its acceptability. The research study had the following experimental set up to conduct a more comprehensive comparative analysis (see Figure 1).

Sampling and Participants

The research used nonprobability convenient sampling method in choosing the participants for the survey. The researcher used the following criteria in choosing participants: (1) consumer who has/had an experience in the field of

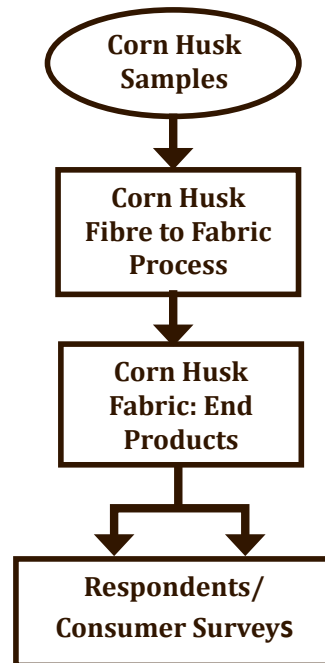


Figure 1. Shows the Flow of Fabric Production

fashion industry, (2) consumer who had taken up formal education in the field of fashion industry, and (3) a Marikina-based consumer . The participant must satisfy at least one criterion mentioned above to be part of the sample. Three groups of consumers were chosen; 3rd and 4th year GFD students , GFD instructors/professors of a college in Marikina.

Data Gathering Instrument

The survey questionnaire served as the main instrument used to gather the data of the study. It was developed by the researcher herself based on related literature and previous studies and was validated by ten selected experienced instructors and professors who are not included as respondents in the study. The comments, suggestions and corrections provided by the validators were incorporated in the final copy and contents of the questionnaire of this study.

Consequently, a five-point Likert scale with adjectival equivalent was used for the variables are as follows:

Table 1

Five-point Likert scale with adjectival equivalent

Scale	Range	Verbal Interpretation
5	4.50-5.00	Highly Acceptable (HA)
4	3.50-4.00	Acceptable (A)
3	2.50-3.49	Moderately Acceptable (MA)
2	1.50-2.49	Unacceptable (UA)
1	1.00-1.49	Highly Unacceptable (HUA)

Data Collection and Analysis

The data gathering procedure started with the experiment itself. Corn *Zea mays* husk samples were collected and prepared. The husks were stripped manually to extract the fibers. The fibers were brought to Philippine Textile Research Institute (PTRI) for the weaving process and the construction of the Corn *Zea mays* husks fabric. The produced fabric was made into table runner, bag, pencil case and coin purse. The researcher personally administered and retrieved the questionnaires to ensure high percentage of return. With the questionnaire gathered, the data were tallied, tabulated and statistically treated for analysis and interpretation.

In executing the method of research and experimental procedure, proper instruments and equipment are prepared and used. Figure 2 shows the step by step process of the experimental procedure. The flow chart shows the process right from the beginning of the experimental period. It started from the collection and preparation of samples, then the fabric production, after that the developed fabrics were manufactured into construction of end products and evaluated by respondents. After the process, the results were gathered and analyzed.

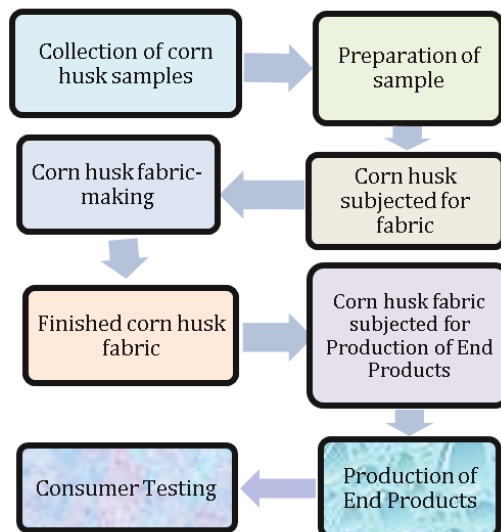


Figure 2. Production of Corn Zea mays Husk Fiber and the Development and Evaluation of Corn Zea mays Husk Fabric

The statistical tools used to treat the data are the following: **Weighted Mean**. This is used to determine the ratings given by the respondents in evaluating the quality of the items made from corn *Zea mays* husk fabric; and **One-way Analysis of Variance (ANOVA)** which was used to determine the significant differences among the evaluations of the three groups of respondents (students, instructors/professors and boutique owners/fashion designers) on the acceptability of the corn *Zea mays* husk fabric.

Results and Discussion

This section deals with the presentation, analysis, and interpretation of the data gathered in the study. Raw corn *Zea mays* husk samples were collected and gathered from corn vendors of Marikina Public Market. The corn covers were stripped and air dried. These fibers were brought to the Philippine Textile Research Institute (PTRI) for the weaving process

and the construction of the corn *Zea mays* husks fabric. The fabric's composition was made to be 80% cotton and 20% corn husk fiber as per PTRI standards. This standard indicates that all indigenous fibers are mixed with at least 70% cotton or polyester threads for the durability of fabric. The produced fabric was made into table runner, bag, pencil case and coin purse. Figure 3 shows the finished product from the produced corn fabric.



Figure 3. Finished products made of corn *Zea mays* fabric

The criteria used to evaluate the product were selected by expert validators, instructors, and professors on the field of

Garments and Textile studies. The researcher then tallied the evaluations of respondents and got the weighted average per criteria of each group. The data gathered were tallied and statistically treated using the weighted mean and analysis of variance (ANOVA).

Respondents' Evaluation on the Developed Fabric with Corn *Zea mays* Husk Fiber in terms of Appearance, Durability, Usefulness, and Eco-friendliness

The summary of evaluation of the three groups of respondents on the fabric with corn husk fiber is presented in Table 2.

Table 2
Summary of Respondents' Evaluation on the Developed/Produced New Fabric with Corn *Zea mays* Husk Fiber

Criteria	Designers		Professors		Student	
	OMW	VI	OMW	VI	OMW	VI
a. Appearance	4.48	A	4.55	HA	4.63	HA
b. Durability	4.70	HA	4.48	A	4.70	HA
c. Usefulness	4.63	HA	4.60	HA	4.68	HA
d. Eco-Friendliness	4.70	HA	4.80	HA	4.77	HA
Grand Weighted Mean	4.63	HA	4.61	HA	4.70	HA

It can be gleaned from the summary on Table 2, that all the three groups of evaluators rated the produced fabric as Highly Acceptable based on the criteria of appearance, durability, usefulness and eco-friendliness as manifested by their grand weighted means of 4.63 for designers, 4.61 for professors and 4.70 for students. This implies that the finished or produced fabric with corn husk fiber may be used in fabricating goods made of fabric.

Test on Significant Difference in the Evaluations of the Three Groups of Respondents on the Acceptability of Fabric with Corn *Zea mays* Husk Fiber

The summary of the computed results of the difference among the evaluations of the designers, professors, and student

respondents on the acceptability of fabric with corn husk fiber are as shown in Table 3.

Table 3

Summary of Analysis of Variance of Respondents' Evaluations on the Acceptability of Fabric with Corn Zea mays Husk Fiber

Criteria	F _{computed} Ratio Value	F _{critical} Ratio Value
Appearance	1.17 **	3.08
Durability	1.54 **	3.08
Usefulness	0.22 **	3.08
Eco-friendliness	0.27 **	3.08

Legend:

- Significant (3.08 above the Fcritical value)
- ** Not Significant (3.08 below the Fcritical value)

As seen in Table 3, the computed F ratio values are less than the critical F ratio value, the statistical decision is not to reject the null hypothesis. Therefore, there is no significant difference among the evaluations of the three groups of respondents on the acceptability of the fabric with corn husk fiber in terms of appearance, durability, usefulness, and eco-friendliness. This implies that a fabric with 80% cotton and 20% corn husk fiber can be produced and is highly acceptable for use as raw material in making bags and other goods.

Conclusion

This study aimed to determine the acceptability of corn *Zea mays* husk fiber as raw material in making new fabric. It was evaluated by 97 3rd and 4th year students of BTTE, BIT, and COT of Garments Fashion and Design Major; (10) GFD Instructors/Professors of a college in Marikina and (10) Fashion Designers/Boutique Owners during the S.Y. 2016-2017.

The group of BTTE, BIT, and COT GFD students, technology teacher-respondents and fashion designers/boutique owners assessed the acceptability of Corn *Zea mays*

Husk Fiber as new fabric with regards to the usefulness, durability, appearance and eco-friendliness which is evident in its overall weighted mean of 4.63, 4.61 and 4.70 respectively which are verbally interpreted as **highly acceptable**. Hence, there is no significant difference in the evaluation of the three groups of respondents on the Acceptability of Corn *Zea mays* Husk Fiber as new fabric with regards to usefulness, durability, appearance and eco-friendliness.

Based on the findings, the study reached two key conclusions which are: (1) the newly developed fabric made of corn husk fiber was highly accepted as new fabric; and (2) the newly developed corn husk fabric has potentials and capability to be accepted in the list of locally-made fabrics. From these findings it can be implied that the newly developed fabric is an eco-friendly product in addition to our indigenous fabrics. The product can also be used for livelihood purposes.

Recommendations

In view of the findings and conclusions of the study, the researcher proposes to conduct further study on the enhancement of the texture and color of the developed product. The researcher also recommends that the corn husk fabric be used in making other kinds of products such as curtains, placemats, storing items, and shoes like sneakers and espadrille. It is also recommended that future researchers should try to combine other natural and polyester fibers to improve the quality and texture of the fabric.

It is also important to note that the study was limited to one standard and testing procedure by the American Society for Testing and Material Standards. Since the study is limited to the evaluation of the fabric by the respondents, it is recommended to future researchers to use other forms of

fabric evaluations like strength and tear testing. Thus, a future research related on the development of the product is recommended. Furthermore, future studies on other indigenous materials should try more standards for a more universal acceptability.

• • •

References

- Bandinelli, R. Rinaldi, R. Rossi, M. & Terzi, S. (2013). New Product Development in the Fashion Industry: An Empirical Investigation of Italian Firms. *International Journal of Engineering Business Management Special Issue on Innovations in Fashion Industry*, 5.
- Garments and Textile Export Board. (January, 2016). *Development of the Garments and Textile Industry*. Retrieved from <http://invest.cfo.gov.ph/pdf/part1/development-of-the-garments-and-textile-industry>.
- Garments and Textile Export Board. (January, 2016). *Development of the Garments and Textile Industry*. Retrieved from <http://invest.cfo.gov.ph/pdf/part1/development-of-the-garments-and-textile-industry>.
- Gay, L. R. (1987). *Educational Research: Competencies for Analysis and Application* (3rd ed.). New York: Merrill.
- Thomasson, S.C. (January-March, 2013). Country Profiles *The Philippines: Textile and Apparel Industry on the Mend*. Retrieved from http://www.textileworldasia.com/Issues/2013/January-February-March/Country_Profiles/The_Philippines-Textile_And_Apparel_Industry_On_The_Mend.