

Developing an Instructional Model to Scaffold Students in Producing Innovative Minangkabau Embroidery

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Abstract—This study is aimed to produce a development model of Minangkabau acculturative embroidery based design materials to enhance creativity and innovative products in learning ornamental variety designs based on industrial needs. The method that has been used in this research was Research and Development (R&D). The results of the study show that the results of the development of embroidery designs based on Minangkabau acculturation with innovative designs are very high following the needs of the industry; with the results of the validity test by the expert team with an average value of Aiken's V above 0.890, in the valid category. This number shows the students' creativity is increasing. This embroidery design development product received a positive response from students who attended lectures on decorative design, lecturers, and embroidery industry. This was shown from the results of the average practicality response questionnaire of 85.96% of students, the lecturer response of 88.04%, and the embroidery industry response of 87.03% with a very practical category; which shows student creativity is increasing, innovative products are increasing, and the relevance of competencies and creativity of students in accordance with industrial needs. The development model of embroidery design product was declared effective. This was obtained from the results of the t-test comparison of embroidery products between before and after development with $t\text{-count} = 9, 236 > t\text{-table} = 1.72$ at a significant level $\sigma = 0,000$. The results of the t-test indicate that there is a significant difference between the results of the product before and after development.

Keywords—embroidery, design, material, acculturative, learning, decorative

I. INTRODUCTION

The Government of Indonesia implements the vision and strategy of education development until 2020 which is directed on educational outcomes. It relevants to the demands of the industry or the world of work [1]. However, the issue of relevance between graduate competencies and industrial demands has not been resolved until now.

In vocational fashion education, one of the problems that is often raised by the industry is the low creativity of students in producing innovative embroidery designs that follow market tastes, low quality and diversification; so that the design developed is often rejected by the industry. In general, the embroidery designs produced are still imitating traditional patterns that are widely used for traditional ceremonial objects (interview PLI student report, 2014-2018). Judging from the value of learning outcomes, 70% get a value below the passing criteria of 75. This proves that students are having difficulty in developing embroidery

designs that can follows the concept of modern product which is suit to the needs of the industry and developed through the research process [2]. The aspects of creativity that are difficult to develop in the appearance of products produced by students include criteria: product novelty, resolution, effectivity, elegance, communication, emotion, surprise, and ethicality [3].

In addition, if viewed from the development of teaching materials (teaching materials) given to students which are not the results of exploration and research needs of industry and consumers as product users yet, that results student competencies have not been relevant [4], and the results of interviews with lecturers 2017). In the principle of vocational education teaching, the curriculum is developed based on the needs of the world of work or industry and innovation with research strategies and independent or exploration development [5]. .

Thus, lack of creativity of students in designing an innovative embroidery missed because of teaching materials is not relevant to the material needs of industry. [6] adds that the success of the students in obtaining a functional competence depends on knowledge process (content) provided by teachers which developed into a learning experience. It is determined by how the material development process design made by lecturers in the curriculum, modules and books as teaching materials.

Based on the problems above, the purpose of research in this article is to produce a Development Model of Minangkabau acculturative embroidery material based design as required in the learning industry of decorative design on the vocational education of fashion. The Development of embroidery design materials will be developed as a model in the form of teaching materials. To facilitate students in understanding the process of fashion design development technology needlepoint embroidery inspired by the art of Minangkabau culture.

II. METHOD

This research was conducted the method of Research and Development for the development of embroidery design materials base on Minangkabau acculturative in accordance o industrial needs. R & D Method is the research methods used to produce a particular product, and test the effectiveness of the product [7] .

Referring to the opinion of [8] and [9], then the procedure adopted in the development of research-based

embroidery design materials of Minangkabau acculturative in accordance with the needs of the industry with the steps as follows: 1) Collection of Information/ Data Phase (formulation of the problem to be studied, carry out needs assessment for the data needs of the industry), 2) designing products (development model of embroidery design material), 3) conduct a focus group discussion (FGD), 4) revise the model, 5) Validating the model design by experts, 6) revision of the design models by researchers, 7) test model / market test, 8) revision of the model, 9) final product.

A. Collection of Information / Data

According to Sugiyono [7], a research can depart from the existence of potential and problems. Based on: a) observation of the student embroidery design creativity and innovative products; b) the results of the data analysis of industrial needs and consumers as users of innovative design products, c) literature study books, the results of research on the characteristics of traditional embroidery designs of Minangkabau [10], a journal; the authors formulate the research problem, the model-based development of material design embroidered of Minangkabau acculturative as required in the learning industry of decorative designs that can improve students' creativity to produce innovative designs that suit the needs of the industry.

B. Conducting a needs assessment

This phase of activities is to analyze the needs of embroidery design development material by: 1) data analysis of student creativity, 2) analysis of the document's data directory design characteristics of Minangkabau, 3) analysis mode, 4) data analysis needs of the industry, 5) data analysis needs of consumers associated with types of materials, motifs, patterns and placement decorative motifs, color combinations, decorative skewers composition, and the type of product

C. Designing Products (Model)

Designing a model done by: (1) improve the quality of the embroidery design which conducted on the task of students according to the needs of industry, include: composition of decoration motif pattern, color combinations, and stab-stab ornamental composition; (2) develop a material model of embroidery based on Minangkabau acculturative design. The Technology development model design is done by following the process steps according to the theory of [11]: namely 1) inspiration, 2) identification, 3) conceptualization, 4) exploration / refinement, 5) definition / modeling, 6) communication and 7) production.

The results of the analysis of the needs of industry and consumers to the data that 85% of Sentra IKM as producer of embroidery give answers about embroidery design development needs still using the art style of Minangkabau culture, but expect the development of design modifications or modernized following the appropriate fashion era. While consumer as users of design products 87% gave answers to the needs of the embroidery design development: follow fashion trends, diversification of various types of embroidery products for fashion in a variety of activities and placement of motifs, colors which is not monotonous.

In data analysis of the industrial needs (manufacturers), the consumer needs, hence designed embroidery design development with a Minangkabau acculturative based technology design development process follows the theory K. Aspelund with the process steps as follows:

1) Early stage (Inspiration)

The research raises the inspiration of embroidery art in Minangkabau culture, which is the embroidery pinhead of Agam area and Suji and gold thread embroidery from the Pariaman area [12], [10].

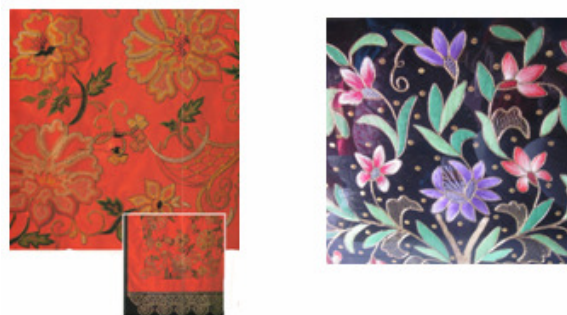


Fig. 1. Sources of inspiration embroidery designs pinhead, suji and gold thread (Source: research [10],

2) The second phase (Identification,)

Identification focused on the characteristics of the design motifs, decorative patterns, motifs on product placement. The identification results show that the characteristics of: 1) the idea of a design motif embroidery pinhead of the Agam area tends to be big roses (rosaspp) and dahlia (Dahlia sp.); and 2) motif embroidery and gold thread suji from the Pariaman area tends to form naturalist chrysanthemums (Chrysanthemum morifolium) research [12], [10].

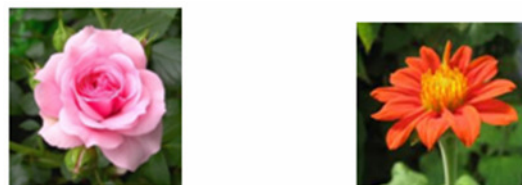


Fig. 2. Characteristics of design motifs embroidered roses pinhead large (rosaspp), suji and gold thread embroidery chrysanthemums (Chrysanthemum morifolium) Source: research [10].

From some of the traditional design pattern has identified visible placement pattern motif that is used tends to fill in the full and running on the edge pattern to ceremonial clothing products (yuliarma, 2016). While many types of color combinations used tends to be the combination of polikromatis in Agam area, and complementary Pariaman area [13].

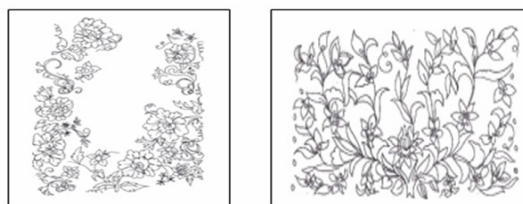


Fig. 3. Characteristic edge decorative patterns and fills a full field (balapak)

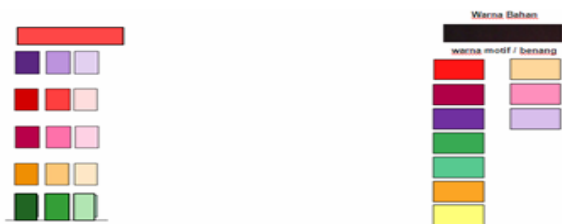


Fig. 4. Characteristics of polychromatic color design and complementary

3) *Third phase (Conceptualization,)*

This sets the stage decision ideas that will be explored and defined the design concept acculturative. Acculturative intended to develop the design by modifying and modernizing [14]. The results of this study istochoose the type of florals rose, dahlias and chrysanthemums. Decorative pattern motiffills the field-free placement on the neck and chest fashion products. The combination of colors and materials adapted to the fashions to show the modern concept. In the color composition, in principle, there are three types of compositions that can be done in a combination of colors, including (1) the arrangement of colors iteration, (2) the arrangement of colors in harmony, (3) the arrangement of a contrasting color [15].

4) *The fourth stage (Exploration / refinement,)*

At this stage the motive designers explore more detailed development. The concept was presented to the image acculturative motif design, includes shape motifs, decorative patterns arrangement pattern, and color combinations [16].

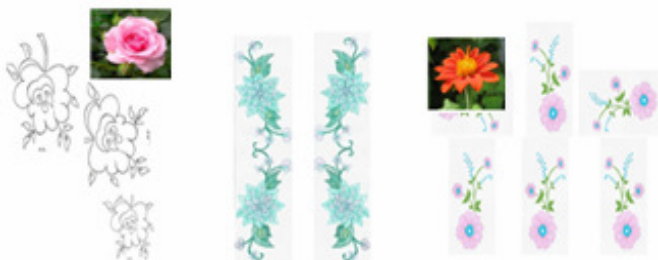


Fig. 5. Exploration of design motifs, decorative patterns and color combinations acculturative

5) *The fifth stage (Idefinition / modeling,)*

At this stage design erarrange placement acculturative motif on fashion products with a silhouette of a model to follow the trend and concept of modern fashion to get the products of innovative design. At this stage, the designer must be committed with a design concept that has been explored.

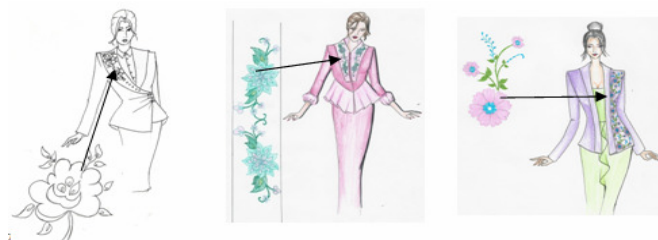


Fig. 6. Modeling based innovative design acculturative design exploration results

6) *The Sixth Stage (Communication)*

This stage is the final presentation that the design is completed and goes into production to make a sample or prototype and marketing since it is an important communication phase to the production team and the client ordering products.

7) *The Seventh Stage (production)*

This stage is the final stage and ensured the design goes into production. No matter how large or small amount of production, designers must collaborate to feedback from the final decision a possible revision of the materials, and construction techniques do not work as planned.

D. *Implement Focus Group Discussion (FGD)*

FGDs were conducted to evaluate the model-based floating acculturative embroidery design materials that have been developed, to test products and get feedback from various parties: students, faculty, and embroidery industry.

E. *Revising the Model by Researchers*

Results Focus group discussions (FGD) were analyzed again for later refinement and revision of development models based embroidery design acculturative material according to the needs of industry.

F. *Model Design Validation by Expert*

After the instrument on the aspects to be measured is constructed based on a particular theory, we then consulted with experts [7]. Design models that have been revised by the researchers, further validation is requested to expert lecturers design / fashion designer (1 person), professor of instructional technology experts (1 person), an arts and culture expert (1 person) to obtain further improvement. The instrument used to collect data in this research is the development of a questionnaire.

G. *Revise Design Model by Researchers*

After the results of product development model based embroidery design materials acculturative validated, then the researchers to revise the advice validator.

H. *Product Trials*

Product design materials development model that has been validated by experts then tested the D3 students of fashion to see its usefulness, practicality and effectiveness.

Product trials conducted to test the individual, small group testing, and field trials. Data have been obtained then analyzed and used to revise the product developed. After going through the process of testing the product, the expected quality of the model developed for the better.

To test level effectiveness products, while the stages are carried out in the following: 1) provide pre-test; 2) allow students doing practical work-based embroidery design acculturative in groups using the product development model design material embroidery; 3) provide post-test. Then the data is analyzed using the Content Validity Ratio (CVR) by Lawshe in [17].

In field trials conducted with respect to student interest in reading the material content of the model embroidered design development acculturative, further inquiry or questionnaire given to students to assess a development model based acculturative embroidery design materials used. From the results of the assessment of the student questionnaire will be analyzed so it appears that from a product development model based embroidery design materials acculturative feasibility study as reference material.

I. Revised Product

If the test results of products obtained unsatisfactory results of the students, then the improvement of the product.

J. Final Product

This stage is the final product that is the result of the development model in the form of teaching materials based embroidery design materials acculturative Minangkabau. A discussion of the final product in the form of a prototype product development model acculturative embroidery designs have been written in the paper journal proceedings of the International ICTVET FT - UNP in 2017.

III. RESULTS AND DISCUSSIONS

A. Results Content Development Model-based Design Embroidery Acculturative

Subjects in this study were students who took the D3 dressmaking courses decorative designs in FPP-UNP. Products produced in this study is a model-based development acculturative embroidery design materials, from product design teaching materials conventional embroidery developed into a product design teaching materials based acculturative embroidery modern, innovative products, diversified and in accordance with the needs of industry [18]. Product development is in line with industry needs patching western Sumatra today, which require technology skills to design and development of innovative design in accordance with the evolving fashion trends[10].

To produce a model of the development of teaching materials design embroidery based acculturative the technology design process is developed through stages as follows: 1) inspiration, 2) identification, 3) conceptualization, 4) exploration/refinement, 5) definition/modeling, 6) communication, and 7) production [11]. This theory is supported by the opinion [19] and [5] stated that the essence of the learning experience provided in the vocational education be of help learners to pursue vocational stages of development, from identification, exploration, orientation, preparation, selection and consolidation of a career in the world of work.

Based on experience students do acculturative designing process technology to follow the steps of the theory, will train students hands-on skills in actualizing to the drawing of design concept, enhanced creativity design motifs, colors and decorative techniques to produce innovative products and diversification of products vary; and to improve the competence of students in the design needlework relevant to industry needs [20]. This is in accordance with the principles of vocational learning that stated by [5], which is based on

the needs of the working world / world of industry and innovation is a very stressed.

Embroidery design technology in the development of traditional *Minangkabau* acculturative based learning materials into an attractive and easy to understand, because it is served with a strategy and a practical and flexible process. Difficulties students face problems mentioned above, which is associated with increasing creativity and competency of students in designing innovative and diversified embroidered products according to the demands of industry, as well as maintaining the value of Minangkabau culture and art; the product development model based acculturative embroidery design material is effectively used.

According [3], characterizes creativity in the resulting product should reveal views of key aspects of creativity include: Novelty, Effectiveness, Elegance, Communication, Emotion, Surprise, Ethics.

Acculturative concept implies, a social process that emerged during a union of two or more different cultures meet each other and influence each other into a new culture without losing the old cultural elements [14]. Acculturative can be interpreted in the development of material design embroidered by: 1) modifying, and 2) modernize the design in a way to modernize traditional design characteristics appropriate fashions, lifestyle and consumer needs; resulting designs Minangkabau innovative character.

B. Data Description

1) Results Validation Instrument Development Model

The results of the validation test conducted by the validator on the model Instrument Design Development of Traditional Embroidery accordance Minangkabau acculturative Industrial Supplies is Valid with Aiken's V value of 0.890. Results of the calculations Aiken ranges from 0 to 1 and has a coefficient of 0.600 can be interpreted quite high. Value $V = 0.890 > 0.600$ expressed in a valid category.

2) Results validation construct and validate the contents of the embroidery design materials Development Model

The testing phase of the feasibility of the use of a development model based embroidery design materials acculturative, conducted with due diligence includes a construct validation, and validation of the content. Data validation score content and construct validation of data obtained from the questionnaire lecturer in design of fashion and expert lecturers in the field of learning technologies, as well as professor of art and culture.

TABLE I. RESULTS OF VALIDATION VALUE

No.	Appraisal	Value Validation	Category
1	Instructional technology	0.83	invalid
2	experts Expert Content	0.85	invalid

3) Revised Design

Based on an assessment of the design validation test in terms of two (2) criteria, this product obtained a construct validation achievement levels of 0.83 and 0.85 in the validation of the contents of Very High category. So in terms

of product design embroidered design development models based acculturative batik pinhead does not need to be revised.

C. Test Data Practicalities

1) Response Manufacturers (industry) against the practicalities of Content Development Model-based Design Embroidery acculturative suit industry requirements

The test results practicalities of the development model design material embroidery suit industry needs according to manufacturers / industry that is 87.03%, so that we can conclude a development model embroidery design materials according to the needs of industrial enter the category "Very Practical".

2) Student Response Against practicalities Content Development Model-based Design Embroidery acculturative suit industry needs

The test results practicalities of a development model based acculturative embroidery design materials as needed by the student industry is 85.96%, so it can be concluded based embroidery design materials acculturative enter the category "Very Practical".

3) Lecturer response to the practicalities of Content Development Model-based Design Embroidery acculturative corresponding Industrial Supplies

The test results practicalities of the development model embroidery design materials as needed according to the lecturer industry is 88.04%, so that we can conclude a development model embroidery design materials according to the needs of industrial enter the category "Very Practical".

TABLE II. DATA TOTAL RESPONSE INDUSTRY, STUDENTS AND FACULTY ABOUT THE PRACTICALITIES OF MATERIALS DEVELOPMENT MODEL-BASED DESIGN EMBROIDERY INDUSTRY ACCULTURATIVE AS NEEDED

No	The Response to Practicality	Percentage Rate	Statement
1	Industry	87.03%	very Practical
2	College student	85.96%	very Practical
3	lecturer	88.04%	very Practical
On Average Rating Producers and Consumers		87.01	very Practical

Table 2. The average yield can test the practicalities of the development model based design material embroidery industry acculturative as required by industry, lecturers and students that is 87, 01%, so it can be concluded that the embroidery design materials enter the category "Very Practical".

D. Effectiveness Test Data

The results of the t-test comparison product design material embroidery between before and after the development of the value t count = 9, 236 > t the table was = 1.72 significance level $\sigma = 0.000$. T-test results showed a significant difference between the results of the product before and after development.

IV. CONCLUSIONS

This research has produced a development model based embroidery design materials acculturative, then obtained some conclusions:

1. Research has resulted in the development of a model-based design material embroidery acculturative valid, practical and effective.
2. The result of the validity test product models by expert teams with an average value of Aiken's V above .890, the valid category.
3. Product development model material this embroidery designs received a positive response from students, faculty, and industry. It can be seen from the results of the practicality questionnaire student responses on average by 85.96%, amounting to 88.04% of lecturers response, and the response was 87.03% embroidery industry with a very practical category. that show the creativity of students increased, innovative products teaching materials increased sharply, and the relevance of the competence and creativity of students according to the needs of the industry,
4. Product development model of teaching materials has been declared effective embroidery designs. It is obtained from the t-test comparisons between the embroidery design products before and after the development of the value t count = 9 236 > t the table was = 1.72 significance level $\sigma = 0.000$. T-test results showed a significant difference between the results of the product before and after development.

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