



Development Of Textile Appreciation Teaching Materials Based on A Scientific Approach

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ABSTRACT

The purpose of this research is to develop teaching materials for the appreciation of decorating textiles based on a scientific approach. This type of research is the research and development (R&D) development model of Bord and Gall. While the steps of the scientific approach consist of 5M namely: observing, asking, gathering information, reasoning, and communicating. The research instrument used a questionnaire and was analysed descriptively. The results of the study are as follows: 1) The results of the validation of teaching materials based on the validation of learning material experts, several aspects must be revised so that the textbook becomes perfect. Based on the calculation of the results of the material expert validation, a value of 90.45 was obtained in the very good category. The results of the validation of learning media experts get a score of 89.92 with the very good category. The results of the review by material experts and learning media experts stated that the teaching materials for appreciation of decorating textiles were appropriate and appropriate for use as teaching materials in appreciation courses for decorating textiles. 2) The results of student response trials were carried out individually and in limited group trials. The results obtained from the individual test were 90.44 for the very good category and the limited group test scored 89.55 for the very good category. Based on the results of individual tests and limited group tests, it can be concluded that the developed teaching materials are suitable for use as learning media.

Keywords: appreciation of decorating textiles, teaching materials, science

1. INTRODUCTION

Improving the quality of learning can be seen from the quality of teacher learning behavior, student learning behavior, learning climate, learning materials, learning media, and learning systems in schools. Realizing quality learning requires a learning media that can improve student achievement.

In this case, the task of educators is to develop the cognitive, affective, and psychomotor functions of students. The emergence of another problem in the world of education is that the approach to learning is still too dominated by the role of the teacher. Teachers place more students as objects and not as subjects of students. Education like this does not provide opportunities for students in learning, to develop the ability to think holistically, creatively, objectively, and logically [1].

Teachers must strive to strive for better, more effective, and more efficient learning. Actions that are seen as effective in increasing student learning achievement are through applying learning methods or models including the way the teacher

applies them and preparing good learning materials [1]. The teacher's ability in learning to prepare lesson material is very important in efforts to improve the quality of learning.

To obtain optimal learning results, students are required not only to rely on knowledge or skills from what happens in class but must be willing and able to explore the various teaching materials needed [2]. With teaching materials, students' memory is much improved and lasts longer. Teaching materials have the potential as tools, facilities, actors, and vehicles to improve the quality of education [2]. The use of more applicable teaching materials can help students understand learning material, and help students easily visualize learning material better so that they can provide better feedback for students [3].

In the appreciation course for decorating textiles, there are no teaching materials that can support and be by more practical courses. In this course, the material studied is in the form of motif designs, decorative stitches, and various types of embroidery. Students often have difficulty in

carrying out the assignments given because there are no teaching materials that are to the characteristics of the course and also the characteristics of students. Although there are several teaching materials, they are not in the current curriculum. The teaching materials used in the appreciation course to decorate textiles are not complete, the method of delivery is in the form of diktat, the teacher explains and illustrates on the blackboard and students follow the steps that have been given. Existing teaching materials are still difficult for students to understand because the steps in the design process are not clear and complete, and the pictures are limited, making it difficult for students to do their assignments. In this lecture, students often have difficulty in determining the materials used and the process of decorating the cloth so the expected results in the practice of decorating the cloth are not as expected.

Efforts made to deal with problems related to the study of cloth decorating appreciation courses that need to be addressed immediately are the development of cloth decorating appreciation teaching materials that are easy to understand and the characteristics and needs of students. Teaching materials are what teachers teach their students. Teaching materials are all forms of material that are systematically arranged to enable students to learn according to the applicable curriculum. With teaching materials, the teacher will be more coherent in making the material and achieving all predetermined competencies [4].

Teaching materials provided by the teacher are messages that must be learned by students and so on adopted as a provision for students after completing their studies. One form of learning media is teaching materials which are an important part of implementing education in schools. Teaching materials or learning materials to achieve competency standards which in outline consist of knowledge, skills, and attitudes that students must learn to achieve predetermined competency standards [5]. Teaching materials can be made in various forms according to the needs and characteristics of the teaching materials presented [6]. Develop diverse and interesting teaching materials so that they will produce a teaching and learning activity that is meaningful both for teachers and students. The attractiveness of teaching materials can be seen from the responses given by teachers and students during product trials. Students are very enthusiastic about the teaching materials provided for study [7].

The paradigm shift in the learning process from being teacher-centered to student-centered learning is expected to encourage students to be actively involved in building knowledge, attitudes, and behavior. Students have independent learning abilities and experience or cooperative learning skills. In a student-centered learning process, students have the opportunity and facilities to build

their knowledge so that they will gain a deep understanding and ultimately be able to improve the quality of their education [8].

One approach that can be used in learning is scientific, namely an approach that uses steps and scientific rules in the learning process. The scientific approach is a student-centered learning approach. Learning in a scientific approach seeks to direct students to actively build their knowledge and skills. A scientific approach for students is needed to improve skills and enrich experiences for new enthusiasm for learning [9]. Learning using a scientific approach allows it to be used to train students' scientific literacy [10]. Students are encouraged to be able to carry out investigations to find facts from phenomena or events and find scientific truths. Students are trained to think logically, coherently, and systematically, by using higher-order thinking capacities. The scientific steps applied include finding problems, formulating problems, submitting hypotheses, collecting data, analyzing data, and drawing conclusions [11]. The scientific approach is intended to provide understanding to students to know, understand, and practice what is being studied scientifically [12]. In the learning process, students are taught to find out from various sources through observing, asking, trying, processing, presenting, concluding, and creating for all subjects.

The need for students for quality teaching materials and for students to be able to learn independently and student-centered requires teaching materials whose approach is student-centered, namely with a scientific approach. A scientific approach to foster independent learning in students [13]. Teaching materials are designed in such a way according to the conditions of students and the learning environment, the aim of which is to attract students' interest in learning it and to make students learn themselves. To produce teaching materials that can play their functions and roles, the material must be of high quality and facilitate the learning process and students can learn creatively without relying on supervisors [14].

The results of the preliminary research show that students' responses to teaching materials based on a scientific approach are very effective, so they are suitable for use in the learning process during the Covid 19 pandemic both online and offline [15]. Scientific-based teaching materials increase student understanding [16]. The development of scientific-based teaching materials is by feasibility in terms of content, language, and design and can increase student reasoning to think logically and scientifically [17]. Student responses to teaching materials based on a scientific approach were very positive and teaching materials based on a scientific approach were very practical and effective for students to use [18-21].

Based on the explanation above, the purpose of this research is to develop scientific-based teaching materials for the Appreciation of Textile Decorating course so that it is hoped that these teaching materials can be used properly by students so that they can improve learning outcomes and also students can study independently.

2. RESEARCH METHODS

In this study, the method used is the research and development method. Development research is a process or steps to develop a new product or improve an existing product that can be accounted for. This type of research is intended to improve practice. This means that the product must apply to the learning process in the field. According to [22] research and development methods are methods used to produce certain products and test these products. The resulting product is a teaching material for the appreciation of decorating textiles with a scientific approach. The development of this teaching material uses the development model of Borg and Gall (1989). The Borg and Gall model consists of ten steps, namely: (1) Research and Information collection, (2) Planning, (3) Developing Preliminary form of the Product, (4) Preliminary Field Testing, (5) Main Product Revision, (6) Main Field Testing, (7) Operational Product Revision, (8) Operational Field Testing, (9) Final Product Revision, and (10) Dissemination and Implementation.

R & D research steps according to Borg and Gall are as follows. 1) Research and data collection. The steps are needs analysis, literature study, literature study, small-scale research, and required standard reports. 2) Planning, and preparing a research plan, including the abilities needed in carrying out the research, the formulation of the objectives to be achieved with the research, the design or research steps, and the possibility of testing in a limited scope. 3) Development of the

initial product draft, this step includes determining the product design to be developed, determining the

research facilities and infrastructure needed during the research and development process, determining the stages of carrying out design tests in the field, and determining the task descriptions of the parties involved in the study. This includes the development of learning materials, learning processes, and evaluation instruments. 4) Initial field trials, this step is a limited product test, namely conducting initial field tests on product designs, which are limited in nature, both the substance of the design and the parties involved. Initial field tests were carried out repeatedly to obtain a feasible design, both substance, and methodology. 5) Revision of trial results, this step is an improvement to the model or design based on limited field trials. Completion of the initial product will be carried out after limited field trials. 6) Field test of the main product, this step

is more product test, including product design effectiveness test, and design effectiveness test (generally using repetition model experimental technique). 7) Product revision, this step is product improvement based on field test results based on input and main field test results. So this improvement is the second improvement after a wider field test was carried out than the first field test. 8) Wide-scale field trials/feasibility tests, this step should be carried out on a large scale, including testing the effectiveness and adaptability of product designs and testing the effectiveness and adaptability of designs involving prospective product users. The field test results are in the form of a ready-to-apply design model, both in terms of substance and methodology. 9) Revision of the final product, this step is a refinement of the product being developed. Improvement of the final product is deemed necessary for more accurate products to be developed. At this stage, a product has been obtained whose level of effectiveness can be accounted for. 10) Dissemination and implementation, namely product reporting in professional forums in journals and product implementation in educational practice. Publishing products to be distributed commercially or free for use by the public.

Instruments before being used in research, instrument testing was carried out both in terms of content and empirically. The validation test aims to test the accuracy of using a measuring instrument and to see whether the instrument used can measure accurately or not. To determine the content validation coefficient, the assessment results from the two experts were entered into a 2 X 2 cross-tabulation. After the items were validated by the 2 assessors, they were then analyzed using Gregory's calculations as follows.

Content validation calculations by 2 experts use the construct validation formula as follows.

$$V_{ck} = \frac{c}{n + c} \quad (1)$$

Based on the results of the instrument test with calculations according to Gregory, the following results are obtained: 1) The content test questionnaire with 20 instruments is all relevant. So that the results of Gregory's calculations obtained content validation 1, meaning that the items had very high content validation. 2) The learning media test questionnaire totals 20 items and all are relevant. From the results of Gregory's calculations, it was found that content validation was 1, meaning that the items had very high content validation. 3) Student response questionnaires totaled 15 items, from the results of Gregory's calculations, content validation was obtained 1, meaning that the items had very high content validation.

Data analysis in this study used quantitative descriptive analysis, all collected data were analyzed

using quantitative descriptive statistical techniques which were quantitatively separated by category to sharpen judgment in concluding. Content validation can be obtained through learning material content experts, while media validation is obtained through learning media experts and student response assessments. The assessment of the results of the expert test and the learning media test is calculated using the following formula.

$$\text{Persentase} = \frac{\text{jumlah jawaban benar}}{\text{jumlah soal}} \times 100\% \quad (2)$$



3. RESULTS AND DISCUSSION

The teaching materials for textile decorating appreciation courses based on a scientific approach were developed using the Borg and Gall model covering ten steps, namely: research and information gathering, planning, development of initial product formats, initial trials, product revisions, field trials, product revisions, field trials, final product revision, dissemination, and implementation.

The first stage of development is research and data collection, this stage begins with 1) Determining the subjects that are the object of development. The course that is used as the object of development is the textile decoration appreciation course in the Family Welfare Education Study Program with a concentration of 3 credits and is taken in semester III. 2) Analyze needs, based on the results of interviews with lecturers who teach textile decorating appreciation courses and students who have taken textile decorating appreciation courses. Until now, the teaching of textile decorating appreciation courses still uses old textbooks with incomplete material. Therefore, it is necessary to make printed teaching materials that are more complete so that students can understand the material contained therein. For this reason, lecturers and students need teaching materials that further motivate students to learn and make it easier for lecturers to facilitate students to learn. 3) the textile decoration appreciation course describes that students can make decorative designs and apply embroidery techniques to textiles which consist of competence in designing ornaments, decorative stitches, and various embroidery techniques.

The second stage is planning including formulating research objectives and estimating funds, manpower, and time in research. Based on the initial information, the researcher wants to develop teaching materials as a guide for students. This stage begins with the collection of materials, collecting pictures. The aim is to produce design teaching materials for the appreciation of decorating textiles that are complete in material and accompanied by pictures that are appropriate to the subject matter.

The third stage is the development of the initial product format. At the development stage, teaching materials are made by the rules of writing

textbooks which consist of an initial section, a content section, and a closing section. The steps for developing a draft of teaching materials for appreciation of textiles are as follows: 1) Establishing a strategy for organizing learning content is carried out immediately after analyzing and determining the types and characteristics of learning materials. The strategy for organizing learning content refers to the selection of content and the arrangement of content. The selection of content is adjusted to the learning objectives that must be achieved contained in the syllabus. This

arrangement is done by presenting the material by the order of the indicators of learning outcomes. The arrangement of content endeavored to present material that is easy for students to understand. To facilitate students to focus attention on things that are learning objectives in teaching materials, these objectives are clearly and firmly informed to students. The learning objectives are presented in each chapter and the placement of learning objectives is placed at each change of subject matter.

2) The initial display of teaching materials is presented attractively according to the content of the material. The cover appearance of teaching materials is made more attractive and colorful to motivate students to open teaching materials and want to study them. In addition to facilitating students to process information in depth by presenting a summary at the end of each chapter. Other things that are done so that students can process information in depth are, 1) prepare practice questions that are presented with practice questions at the end of the chapter. 2) Determine the components of the textbook draft including a) introductory page consisting of the title page, table of contents, list of figures, list of tables, preface, and experts. b) the main page consists of detailed descriptions of each chapter, and sub-chapters accompanied by examples of exercises and questions that must be completed by students. c) The cover page consists of appendices, a bibliography, an answer key, and a glossary.

The teaching materials are arranged based on a scientific approach which consists of observing, asking, gathering information, associating, and communicating. Explanation of scientific steps are as follows: 1) Observing, learning activities that students can do, for example, reading, listening, paying attention, and seeing (with or without tools). The competencies to be developed through observing learning experiences are practicing sincerity, thoroughness, and the ability to seek information. 2) Asking, learning activities that can

be carried out are asking questions about what information is not understood from what is observed or questions to obtain additional information about what they are observing. 3) Collecting information, by conducting experiments, observing objects, observing events, carrying out

certain activities, to interviewing a resource person, 4) Associating learning activities by processing information starting from various. 5) Communication by carrying out learning activities in the form of conveying the results of observations that have been made. The conclusions he obtained were based on the results of the analysis, carried out either orally, in writing, or other ways and media.

The fourth stage is the initial trial. Initial trial activities were carried out with learning material experts and learning media experts. The material expert involved in reviewing teaching materials for appreciation of textiles is a lecturer in Fashion Design at the Family Welfare Education Study Program. Based on tests conducted by two material experts, the results obtained can be seen in Table 1.

Table 1. Results of Learning Material Expert Validation

Indicator	Expert 1	Expert 2	Total Score	Category
Content Eligibility	91	91	91	Very good
Eligibility of Presentation	91.67	88.33	90	Very good
Language Assessment	90	90	90	Very good
Total Overall Score	90.9	90.00	90.45	Very good

Based on the calculation of the results of the material expert test questionnaire, a value of 90.45 was obtained with very good qualifications. The results of the review of the two material experts stated that teaching materials for the appreciation of decorating textiles based on a scientific approach were appropriate and appropriate to be used as teaching materials in textile decorating appreciation courses. The assessment aspects consisted of content

feasibility, presentation feasibility, and language assessment feasibility.

Meanwhile, the learning media experts who were involved in reviewing teaching materials for appreciation of decorating textiles were lecturers in Informatics Engineering Education, Faculty of Engineering and Vocational Studies, Undiksha. The lecturer was chosen because he knows about learning media. Based on the tests carried out by two media experts, the results can be seen in Table 2.

Table 2. Results of Learning Media Expert Validation

Indicator	Expert 1	Expert 2	Total Score	Category
Teaching Material Size	90	90	90	Very good
Teaching Material Cover Design	93.33	91.11	92.22	Very good
Teaching Material Content Design	84.45	86.67	85.56	Very good
Typography	92.72	90.91	91.81	Very good
Total value	90.23	89.87	89.92	Very good

Based on the questionnaire data from the results of the evaluation of learning media experts that were processed, a percentage of 89.92% was obtained in the very good category. While the results of the review of the two media experts stated that scientific-based textile decorating appreciation teaching materials were appropriate and appropriate to use. The aspects assessed consisted of aspects of the size of teaching materials, aspects of the cover design of teaching materials, aspects of the content of teaching materials, and aspects of typography.

The fifth stage is product revision. Based on the results of the initial trial, the researcher made improvements to product development input from material experts and learning media experts. As for what is being revised, input from learning material experts is that the library used must be up-to-date, the pictures are adapted to the material, and the steps for making it. Images must be clear and not blurry. Material adapted to the development of fashion. While the input from learning media experts is that

the front cover is added with the university logo, the use of letters is adjusted to the field, and the placement of layout elements is consistent based on the pattern.

The sixth stage is the field test. After the revision, it is necessary to test it on individual student groups and limited groups. The trial was carried out on fifth-semester students of Fashion Design at Ganesha University of Education. To measure student responses to teaching material products that have been developed. The trial was carried out individually and in a limited group trial. Individual trials were carried out by 3 students who had low, medium, and high abilities.

Based on the trial results, the individual test results obtained were 90.44 in the very good category in terms of interest, material aspects, and language aspects. While the limited group test was carried out by 11 students. Based on the results of the limited group trials, the results were 90.31 in the very good category in terms of interest, material

aspects, and language aspects. The seventh stage of product revision. At this stage, revisions were made from student input in individual tests and small group tests. The input is that there are still errors in writing and there are some images that are difficult to understand so there are updated images. The eighth stage is field testing, the ninth stage is revision of the final product, and the tenth stage is dissemination and implementation which has not been carried out due to time constraints and the covid 19 pandemic. The stages which have not been implemented will be continued in the following semester.

Development of teaching materials for textile decorating appreciation courses based on a scientific approach using the Bord and Gall model which consists of 10 steps but in this study, only 7 steps were carried out, the next steps will be carried out in the following semester. The 7 development steps consist of research and information gathering, planning, initial product format development, initial trials, product revisions, field trials, product revisions, field tests, final product revisions, dissemination, and implementation. Teaching material trials were carried out in the fourth step with the validation of teaching materials by 2 learning material experts and 2 learning media experts. The results obtained from the validation test for material experts and learning media experts scored 90.45 and 89.92 in the very good category.

The design of the content of teaching materials includes: 1) layout consistency consisting of, 2) layout elements, 3) complete layout elements, 4) layout accelerating understanding consisting of placing decorations/illustrations as a background so as not to interfere with understanding, 5) layout accelerating understanding, 6) content typography, 7) easy-to-read typography, 8) book-content typography makes it easy to understand. The feasibility aspects of learning materials consist of 1) content eligibility aspects, presentation feasibility aspects, and language assessment aspects, 2) feasibility aspects, and 3) language assessment aspects.

Teaching materials are prepared based on preliminary studies in the form of determining courses that do not have instructional media, then analyzing the syllabus and lesson plans. Teaching materials are arranged based on the terms or conditions of teaching materials. According to [2] general teaching materials have book anatomy which consists of 1) The introductory page consists of the title page, table of contents, list of figures, list of tables, preface, and experts. 2) The core page consists of detailed descriptions of each chapter, and sub-chapters accompanied by examples of exercises and questions that must be completed by students. 3) Cover page consists of appendices, a bibliography, an answer key, and a glossary. The development of teaching materials needs to be carried out

systematically based on interrelated steps to produce quality teaching materials [5]. The preparation of teaching materials does not only include how to determine the type of material, depth, scope, order of presentation, and treatment of learning material but also how the teaching material becomes a tool for students to understand the main material outlined in the curriculum. Teaching materials should be structured as an elaboration of competency standards, basic competencies, indicators, and subject matter in the curriculum [23].

Teaching materials for the appreciation of textiles are developed based on a scientific approach. A scientific approach is an approach that consists of 5 steps, namely observing, asking, gathering information, reasoning, and communicating. The opinion of Pane [24] is that scientific-based teaching materials are teaching materials that contain 5M scientific stages including the stages of observing, asking, gathering information, reasoning, and communicating. The important thing that must be considered is the suitability of textbooks in supporting learning with a scientific approach [25]. Teaching materials function as a guide for educators to direct all learning activities, as well as being the substance that is taught to students [26].

The draft teaching material for appreciation of scientifically based textiles that has been validated by material experts and learning media experts is tested on students. The trials were carried out individually and in group trials. The results obtained from the individual test were 90.44 for the very good category and the limited group test scored 89.55 for the very good category. Based on the results of individual tests and limited group tests, it can be concluded that the developed teaching materials are suitable for use as learning media. The results of the study show that teaching materials developed with a scientific approach are very suitable for use by students [27].

Students like teaching materials that are easy to understand and interesting. Teaching materials that are easy to understand are teaching materials that use effective language, the meaning of the words is clear, and the sentences are not convoluted. Students can learn competency coherently and systematically because they use teaching materials, so they can master all competencies as a whole and integrate them. Teaching material is appropriate if it meets the eligibility of content, language, and presentation. A readability test is also needed to test teaching material so that it is known to what extent it is easily understood by students. This is in line with Yuberti's opinion that good teaching materials must include: 1) study instructions (teacher and student instructions), 2) competencies to be achieved, 3) supporting information, 4) exercises, 5) work

instructions, can be in the form of worksheets (LK), 6) evaluation [4].

The results of the research by Setiyadi, et al [28] stated that based on the implementation criteria of learning using scientific approach-based modules with good categories, it means that the implementation of learning using scientific-based learning modules is well implemented or high and students are actively involved in learning. In addition, it appears that the developed module can direct students to be actively involved and interact with their friends and interact with the teacher to convey and solve related problems or questions. This compiled student book contains the contents of teaching materials which include knowledge, skills, and values that cannot be separated from one another in learning, but are an integrated whole [29].

The integration of a scientific approach to teaching materials aims to create student-centered teaching materials (Student Center) so that they contain productivity insights, and life skills and can stimulate curiosity (Curiosity). One scientific approach is presented in a form that supports learning which is expected to have the potential to effectively improve students' abilities [30]. There are significant differences in fluency responses between students who study with the scientific approach and the direct learning approach; there are significant differences in fluency responses between students who have high, medium, and low social intelligence, both in scientific learning approaches and direct learning, students with high social intelligence levels have better fluency responses compared to students who have medium or low social intelligence, and students with moderate social intelligence have a better fluency response than students who have low social intelligence, at all levels of social intelligence students who are taught with a scientific approach have a better fluency response than students who are taught using a direct learning approach [31]. The module already contains steps for a scientific approach that makes the activities of teachers and students have good criteria, the module has made students carry out the learning process according to the principles of a

scientific approach so that students get high learning outcomes [32].

The development of teaching materials is a process of determining or creating a condition that causes students to interact and play an active role in learning activities [33]. In the learning process, the development of teaching materials must be

developed because monotonous learning causes students to become bored [34]. The development of this syntactic teaching material is related to the development steps carried out, which are scientifically based and are on the learning objectives, including the characteristics of the users [35]. By using the teaching materials developed, the teacher will be more confident in carrying out

learning activities so that the transformation of science and technology which is his responsibility in class can be carried out effectively and efficiently [5].

4. CONCLUSION

Development of teaching materials for appreciation of decorative textiles based on a scientific approach using the Bord and Gall model is carried out only up to 7 stages, namely: development consisting of research and information gathering, planning, development of initial product formats, initial trials, product revisions, field trials, revisions product, field test, final product revision, dissemination, and implementation. While the steps of the scientific approach consist of 5M namely: observing, asking, gathering information, reasoning, and communicating.

Based on the validation results of scientifically based textile decorating appreciation teaching materials based on the validation results of learning material experts, several aspects must be revised so that the textbook becomes perfect. Based on the calculation of the results of the questionnaire, a presentation of 90.4 was obtained with very good qualifications. The results of the validation of learning media experts obtained a value of 89.92 with a very good category. The results of the review by material experts and learning media experts stated that scientific-based textile decorating appreciation teaching materials were appropriate and appropriate for use as teaching materials in textile decorating appreciation courses.

The results of student response trials were carried out individually and in limited group trials. The results obtained from the individual test were 90.44 for the very good category and the limited group test scored 89.55 for the very good category. Based on the results of individual tests and limited group tests, it can be concluded that the developed teaching materials are suitable for use as learning media.

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