The development of three-dimentional media chart to make golbi cleavage in sewing technology course

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Abstract. This study aims at developing the three-dimensional (3D) media chart for Making Golbi Cleavage of Sewing Technology course in State Vocational High School 1 Depok and knowing the feasibility of the 3D media chart in making Golbi Cleavage. This media is expected to be able to help the learning process and improve the efficiency and effectiveness of learning. This research can be categorized as Research and Development with the 4D development model based on Thiagarajan. The research development was done through 4 stages, i.e. define, design, develop and disseminate. The data collection techniques were using observation, interviews, and questionnaires. The data analysis techniques used descriptive statistical analysis. The instrument validity used the construct validity and Alpha Cronbach reliability testing. The media validation of the Three-Dimensional (3D) Chart was carried out by 3 media experts, 2 material experts and the students through the small scale test on 6 students and the large scale test on 29 students. The Three-Dimensional (3D) Media Chart was considered very feasible by obtaining the percentage of 100% from the experts and 83.2% from the students. This media was feasible based on the content and the appearance aspect.

1. Introduction
Sewing technology is one of compulsory courses of fashion design department in vocational high schools. There is one basic competency in sewing technology that must be achieved, i.e. making Cleavages in a product, or it usually called the manufacture of Golbi Cleavages. Mastering this competency needs mutual efforts from teachers and students. In fact, the observations result of the teaching and learning process in sewing technology subjects in X fashion design class of State Vocational High School 1 Depok, the students appear to have difficulty in understanding the procedure in making Golbi Cleavage because it requires high accuracy. It still becomes abstract concept among students, especially those who have never made it. They find it difficult to understand the order of mounting zipper as well as the installation of tongue and cleavage of dress. It is hard for them because it involves accurateness and good comprehenson of Golbi form that will be made. Only 13 students out of 29 students can complete the Golbi Cleavage correctly on time. During the learning process, many students ask the teacher or the classmate for several times since they are confused about the correct working procedures. The use of existing media, such as job sheets, handouts and whiteboards, is not able to fulfill the students’ needs in grasping the desired material in short time. It certainly makes the teaching and learning process take a long time which is not effective.

To enhance the effectiveness of the learning process, proper learning media is needed. Learning media are tools, methods and techniques to make communication and interaction between teachers and students more effective [1]. The media play an important role in the learning process. The success of
learning is largely determined by the two main components namely, teaching methods and learning media. The function of the media in the learning process is to improve the stimulation of students in learning activities [2].

The learning media of the Three-Dimensional (3D) Chart is believed to be able to meet the students’ needs because it can present the steps of Golbi Cleavages making with the objects examples. It can prove the students a real experience by reviewing every step in the process of Golbi making from the preparation until the completion process [3]. In addition, this media can hone students abilities in analyzing the working procedure independently. This media can also stimulate the discussion process.

Based on the description above, it is beneficial to develop of Three-Dimensional (3D) Media Charts in Making Golbi Cleavage for Sewing Technology course in X Class of Fashion Design in State Vocational High School 1 Depok.

2. Research method
2.1. Development mode
This study can be categorized as or Research and Development (R&D) which is aims at producing certain products, and test the effectiveness of the developed products [4].

2.2. Development procedure
This development used a 4D development procedure based on Thiagarajan including Define, Design, Develop, and Disseminate [5].

2.3. Design of product testing
The trials were carried out on a small scale and large scale. The small-scale trial was to find out the weaknesses of the media so that the large-scale media trials can be more accurate.

2.4. The subject of product testing
The subjects in this study were 29 students of X class of Fashion Design in State Vocational High School 1 Depok. In the implementation stage, it was divided into two, 6 students for small scale and 29 students large scale trial.

2.5. Data collection technique
The observation technique used in this research was non-participatory observation in which the observer did not participate in the activities. The observation in this study served to reveal, the students’ characteristics and the weakness of the learning process learning in X class of Fashion Design on the sewing technology course. The data collection was done through interviews to determine the availability of learning media and the need for Three-Dimensional (3D) Media Chart for making Golbi parts in State Vocational High School 1 Depok. This interview activity was carried out to teachers of sewing technology subjects. The interview is done systematically with the help of interview guidelines. The research instrument in this study was in the form of a questionnaire given to material and media experts as well as the students as respondents. The questionnaire contained statements arranged based on the theory. The questionnaire used the Likert scale with four answer choices, namely Very Feasible (VE), Feasible (E), Infeasible (I), Very Infeasible (VI).

2.6. Data analysis techniques
The data were obtained from the feasibility testing from the media experts, the material experts and the students. Those were analyzed through descriptive statistics. It was used to analyze data by describing the data that has been collected without making conclusions for generalizations.
Table 1. The assessment criteria of the media for the experts [6].

| Criteria of Media Quality | Score Interval | Percentage |
|---------------------------|----------------|------------|
| Feasible                  | (Smin + p) ≤ S ≤ Smax | 50%-100%   |
| Infeasible                | Smin ≤ S ≤ (Smin + p - 1) | 0%         |

Table 2. The assessment criteria of the media for the students [7].

| Category       | Score Interval                                                                 |
|----------------|--------------------------------------------------------------------------------|
| Very Feasible  | ≥ 0,80 x highest score                                                         |
| Feasible       | 0,80 x highest score > x ≥ 0,60 x highest score                                 |
| Infeasible     | 0,60 x highest score > x ≥ 0,40 x highest score                                 |
| Very Infeasible| < 0,40 x highest score                                                         |

3. Results and Discussion

3.1. Define stage

3.1.1. Initial analysis

The initial diagnosis was done through classroom observation and interviews with the teachers of Sewing Technology subjects. During the observation, it tried to clarify the learning process that was carried out to identify the problems that existed during the learning process and the possible solutions. The results of observations during the learning process in class were as follows, a) The absence of visual-based media that was accompanied by the examples of objects that explain or show the process or procedure for making a product, b) the students still faced difficulties in completing their assignments It made the students very dependent on the instructions and demonstrations from the teacher on Golbi Cleavage detail and coherent.

3.1.2. The students' analysis

In this stage, the students' characteristics were learned, such as their ability, motivation, background, learning experience, etc. The observations result that was assisted with the analysis of the table showed that a) most students showed high enthusiasm and positive attitude. The students also did not hesitate to give an explanation to their peers who were confused. They were fairly expressive and rather easily bored, b) The students have high learning motivation during the learning process in the class, c) Some students can complete their assignments on time, their sewing ability was good and their neatness was quite high. However, some other students were still slow and need to be accompanied in every stage of the process.

3.1.3. Main assignments analysis

It was analyzing the main tasks that were done by referring to the syllabus of Sewing Technology in the X class of Fashion Design. Based on the interviews with the teacher of the subjects, the sewing competencies need to be achieved by students including analyzing and making the cleavage in the product. The learning indicators contained preparing tools and materials to make Golbi cleavage that is in accordance with the results criteria referring to OSH procedures.

3.1.4. Concept formulation

Formulating the concept was done by analyzing the concepts being taught and the steps that were carried out and writing down the results of the previous analysis, such as initial diagnosis, student analysis and analysis of the main tasks in order to find a solution.
3.1.5. Formulating learning purposes
This stage was to determine the behavior change expected by the researcher. This stage referred to the lesson plan used by the teacher in the learning process. Based on the interviews conducted with the teachers of Sewing Technology subjects, the achievement indicators contained in the syllabus and lesson plans included the learning objectives that need to be achieved by students, i.e. students can prepare tools and materials in making Golbi cleavage, can make Golbi cleavage that was in accordance with the results criteria referring to OSH procedures.

3.2. Design stage

3.2.1. Analysis of student ability.
This criterion test was conducted as a benchmark to what extent the students' ability in completing the main given tasks by knowing the students' characteristics in the process of completing their assignments. This was done by trying to make Golbi cleavage contained in the syllabus.

3.2.2. Media selection
The researcher decided and formulated the learning media which was appropriate to the material for making Golbi and the students' characteristics. The process of selecting instructional media was assisted through the literature study to match the needs of students according to the existing theories. The Three Dimensional Media (3D) Chart was considered to be an appropriate learning media because it showed the examples or the imitation of the objects presented in three-dimensional without projections. Moreover, it can be easily moved from one class to class. It also contained the preparation of the tools and materials that were needed as well as the steps to make Golbi in detail to be easily understood by students.

3.2.3. Presentation selection
The presentation of three-dimensional learning media chosen by researchers was the Three-Dimensional (3D) Media Chart. The media presented the examples of Golbi cleavage, the preparation process and the process of making Golbi cleavage until the completion stage.

3.2.4. Presentation design
The media design was created with the help of CorelDraw and PowerPoint. The media material was arranged in sequence and to enhance its aesthetic aspect, such interesting colors and lines were applied to attract attention and increase students’ focus.

3.3. Develop stage

3.3.1. Feasibility test from the experts
In this stage, an evaluation was carried out by experts in their fields. The validation process was carried out by 3 experts in their fields, 2 lecturers of Fashion Design Education from the Faculty of Engineering of Universitas Negeri Yogyakarta and a teacher as well as the head of the Department of Fashion Design in State Vocational High School 1 Depok.

The media feasibility test was conducted by 3 media experts by using the instrument in the form of a questionnaire. The instrument in the form of a non-test questionnaire with the Guttman scale to provide feasible and improper alternative answers from the media experts. The suggestions given were used to improve the learning material and design.

| Validator                  | Score | Results |
|----------------------------|-------|---------|
| The Media Expert 1         | 60    | Feasible|
| The Media Expert 2         | 60    | Feasible|
| The Media Expert 3         | 60    | Feasible|
Based on the assessment results of the media experts, it was obtained a total score of 60. Based on the score conversion guidelines for quantitative data, this result of the learning media can be categorized as "feasible". It means that the media experts consider the three-dimensional (3D) media chart in making Golbi cleavage is suitable to be used as a learning media. The feasibility results of the three-dimensional (3D) media chart can be seen in Table 4.

Table 4. Percentage of validation results for the media experts of 1, 2, and 3

| Class | Assessment Category | Frequency | Percentage |
|-------|---------------------|-----------|------------|
| 1     | Feasible            | 60        | 100%       |
| 0     | Infeasible          | 0         | 0%         |
| Total |                     | 60        | 100%       |

Based on the feasibility results from the media experts, it was considered feasible to be tested with some suggestions in case of the use of attractive colors on the media, the font thickness and the sample objects. The revision was done referring to the inputs from the experts until it was declared feasible without revision.

The material feasibility test was done by the two material experts. They were given an assessment by using instruments in the form of the questionnaire. It was a non-test questionnaire with the Guttman scale to provide feasible and improper alternative answers from the media experts.

Table 5. Validation results from the material experts

| Validator          | Score | Results |
|--------------------|-------|---------|
| Material Expert 1  | 22    | Feasible|
| Material Expert 2  | 22    | Feasible|

Based on the assessment results of the media experts, it was obtained the score of 22. Based on the score conversion guidelines for quantitative data, this result of the learning media can be categorized as "feasible" so it can be concluded that the material experts stated the three-dimensional (3D) media chart in making Golbi cleavage is suitable to be used as the learning media. The percentage results of the feasibility of the three-dimensional (3D) media chart can be seen in Table 6 below.

Table 6. Percentage of validation results from the material experts of 1 and 2

| Class | Assessment Category | Frequency | Percentage |
|-------|---------------------|-----------|------------|
| 1     | Feasible            | 22        | 100%       |
| 0     | Infeasible          | 0         | 0%         |
| Total |                     | 22        | 100%       |

Based on the feasibility of the material experts, it was considered that this media was feasible to be tested with several suggestions in the case of its conformity with the theory and the Basic Competency as well as its material indicators. The revision was done referring to the inputs from the experts until it was declared feasible without revision.

3.3.2. Feasibility testing by the students

The trial was conducted at State Vocational High School 1 Depok on 6 randomly selected students of X class. The students were shown learning media and given the explanation of the use of the 3-D media charts. To measure the feasibility of the developed media, the students were given the non-test questionnaire. The media feasibility instrument used the Likert scale with the provided responses of Strongly Agree (4), Agree (3), Less Agree (2), and Disagree (1).
Table 7. Percentage of feasibility results in students’ small-scale trial

| Assessment Category | Frequency | Percentage |
|---------------------|-----------|------------|
| Strongly Agree      | 345       | 69%        |
| Agree               | 155       | 31%        |
| Less Agree          | 0         | 0%         |
| Disagree            | 0         | 0%         |
| Total               |           | 100%       |

Based on the results of small-scale tests by students on the developed 3D media, it was considered very feasible to be used as a learning media. Then, the large-scale trial was conducted with the number of 29 students from X class of Fashion Design in order to determine the feasibility of the developed media.

Table 8. The percentage of the feasibility results from the large-scale trial

| Assessment Category | Frequency | Percentage |
|---------------------|-----------|------------|
| Strongly Agree      | 1819      | 75.4%      |
| Agree               | 593       | 24.6%      |
| Less Agree          | 0         | 0%         |
| Disagree            | 0         | 0%         |
| Total               |           | 100%       |
| Average             |           | 83.2%      |

3.4. Disseminate stage

The media of the Three Dimensional (3D) Chart was displayed before the class and explained by the researcher. Based on the results of data analysis, there was the average of 83.2% that was obtained. So, it can be concluded that the developed media has been approved as the learning media that is very feasible. In the context of the development of teaching materials, the dissemination stage was carried out by means of socialization through material distribution in a limited number to the teachers and the students. In addition, the disseminated stage was also in the form of the journal article creation so that it can be used as a reference for further researches.

4. Conclusions

Based on the results and discussion, several conclusion can be drawn as follows. The Three-Dimensional (3D) Media Charts has been successfully developed with 4D stages according to Thiagarajan: a) Define (definition/ analysis) covering the needs analysis stage, b) Design including the stage of designing, c) Develop (development/ implementation) covering the stage of conducting validation or feasibility tests by experts as well as small-scale trials and large-scale trials, d) Disseminate (dissemination/ evaluation) of media that has been revised and declared feasible can already be used as the classroom learning media.

The Three-Dimensional (3D) Media Chart in Making Golbi Cleavage is considered feasible as the learning media. It can be seen from the experts’ validation with the score of 100% from the material experts and the media experts. In the small-scale trial, the percentage score of Strongly Agree with 69%, Agree with 31%, and 0% Less Agree (and Disagree. Meanwhile, the large-scale trial obtained the percentage of Very Agree with 74.5%, Agree with 24.6%, as well as 0% for Less Agree and Disagree. With the average score of 83.2%, the developed three-dimensional (3D) media can be categorized as “very feasible” to be used as the learning media.

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