DHARMA ACARIYA NUSANTARA : Jurnal Pendidikan, Bahasa dan Budaya
Vol.1, No.2 September 2023
e-ISSN: 2985-962X; p-ISSN: 2986-0393, Hal 103-115
DOI: https://doi.org/10.47861/jdan.v1i2.487

Development Of Flipcharts As A Learning Media With Material On The Human Digestive System For Students At SMP Negeri 4 Bitung

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Abstract: *This research was carried out by looking at adapting a product to be developed to existing problems in the learning process, especially for learning media, which may have little impact on students. The development of flipcharts as a learning medium could be an effort that has a good impact on the continuity of learning activities. This research model uses research and development using stages 4 – D. The process of developing flipchart media is carried out until the dissemination stage. This model includes Devine (analysis), Design (Design), Develop (Development), and Dissemination. The Devine stage includes initial observations at the school where the research was conducted, namely at SMP Negeri 4 Bitung. This is then continued with the product design stage, including preparing materials and creating images arranged to convey ideas about the media that will be developed. In the next stage, product development is carried out, which includes assessments from material experts and media experts as well as with study field teachers to see whether a product is suitable for application in learning. The next stage is Dissemination, which includes trials on students, and this stage is carried out in small group trials of 5 to 20 students at SMP Negeri 4 Bitung. The results of the research carried out show that from the validation test, material experts got an average score of 80%, media experts got an average score of 80%, subject teachers got an average score of 84%, and from trials on Students obtained an increase in their test scores before the flipchart media was 65%, after the flipchart media the students' scores increased to 89%. So, it can be concluded that flipcharts as a learning medium are suitable for use and are adequate for application in learning.*

Keywords: *Flipchart, Learning Media, Digestive System, 4-D Model*

Abstrak: Penelitian ini dilakukan dengan melihat penyesuaian suatu produk yang akan dikembangkan dengan masalah yang ada didalam proses pembelajaran, khususnya untuk media pembelajaran yang mungkin tidak terlalu berdampak bagi peserta didik. Maka pengembangan *flipchart* sebagai media pembelajaran bisa menjadi salah satu upaya yang memberikan dampak baik dalam keberlangsungan kegiatan pembelajaran. Model penelitian ini menggunakan penelitian pengembangan (*Research and Development*) dengan menggunakan tahapan 4 – D. Proses pengembangan media *flipchart* dilakukan sampai tahap *dessimination*. Model ini mencakup *Devine* (analisis), *Design* (Desain), *Develop* (Pengembangan), *Dessimination*. Pada tahapan *Devine* mencakup tentang observasi awal disekolah tempat penelitian yakni di SMP Negeri 4 Bitung. Kemudian dilanjutkan dengan tahapan *Design* produk meliputi penyusunan materi, pembuatan gambar yang disusun untuk menyampaikan ide tentang media yang akan dikembangkan. Dalam tahapan selanjutnya dilakukan sebuah *develop* produk yakni mencakup penilaian dari ahli materi dan ahli media serta dengan guru bidang studi untuk melihat kelayakan dari sebuah produk layak tidaknya untuk diterapkan dalam pembelajaran. Tahap selanjutnya yaitu *dessimination* yaitu meliputi uji coba terhadap peserta didik dan tahapan ini dilakukan pada uji coba kelompok kecil 5 sampai 20 peserta didik di SMP Negeri 4 Bitung. Hasil penelitian yang dilakukan menunjukkan bahwa dari uji validasi yakni pada ahli materi mendapat nilai rata-rata 80%, dari hasil ahli media mendapat nilai rata-rata 80%, dari guru bidang studi mendapat nilai rata-rata yakni 84% dan dari uji coba terhadap peserta didik mendapatkan hasil peningkatan nilai dari nilai tes sebelum adanya media *flipchart* adalah 65%, setelah adanya media *flipchart* nilai dari peserta didik meningkat menjadi 89%. Sehingga dapat disimpulkan *flipchart* sebagai media pembelajaran layak digunakan dan efektif untuk diterapkan dalam pembelajaran.

Kata kunci: Flipchart, Media Pembelajaran, Sistem Pencernaan, Model 4-D

Received Juli 30, 2023; Revised Agustus 30, 2023; Accepted September 22, 2023
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INTRODUCTION

Learning in schools must be done using learning media to increase students' curiosity and activeness. Educators must be more creative in designing learning so that learning runs well and can influence students to create activities in the learning process and increase students' interest in learning and learning outcomes. According to Budiman (2017), learning media is a collection of tools educators use to increase student activity. Then, using flipchart media, educators can make the teaching and learning process run better and more effectively (Budiman, 2017).

Based on the results of observations and interviews with science subject teachers at SMP Negeri 4 Bitung, information was obtained that one of the main problems in science learning is the lack of student activity which results in low student learning outcomes, even in one class less than 50% of students which can achieve a KKM (Minimum Completeness Criteria) score of 70. From the results of observations made, the learning media used by educators is charta.

Therefore, the researcher will develop flipcharts as a learning media titled: "Development of Flipcharts as a learning media on human digestive system material for students at SMP Negeri 4 Bitung." This media can become a learning media that has useful benefits for students. It can increase students' interest in learning and improve learning outcomes.

METHOD

This research design uses development (Research and Development), a method used to produce products and test the feasibility of a product. This research can create products used in the teaching and learning process, called flipchart media. Development research on this product was carried out to determine the suitability of the media in the teaching and learning process. Therefore, it is necessary to have a research design with procedures or steps to carry out this research well and precisely. The development model that is the basis for this research is the 4D development model (four-D model) introduced by Thiagarajan in 1974, and this model also has stages, namely define, design, develop, and dissemination.).

This research was conducted at SMP Negeri 4 Bitung, Papusungan, Lembeh Selatan sub-district, Bitung city. This research was born in the odd semester of 2022. The type of research used was the development method (Research and Development). Development research is a process or steps to create new products and update existing products so that they are accountable.

The research instrument used to collect information in this research was a questionnaire. The questionnaire contains a written list of questions that respondents must answer. The device was prepared to determine the suitability of flipcharts as a biology learning medium on the

human digestive system. Research data collection techniques can be designed in several stages, namely observation, interviews, questionnaires, and tests, so the data obtained is clear and can be used.

RESULT AND DISCUSSION

A. Result

Research on the development of flipchart-based media on the human digestive system was conducted from August to September 2022. The analysis was carried out by adapting the 4D (Four D) development model introduced by Thiagarajan (1974), which includes the define, design, develop, and dissemination stages.

1) Define stage (defining) Flipchart-based science learning media.

The first stage of developing flipchart-based media begins with the planning stage, which the developer carries out to realize the goals and direction of creating a product. The steps at this stage include: 1. Initial analysis, and 2. Material analysis

a) Initial analysis

The research stage is the definition or analysis by conducting initial observations at SMP Negeri 4 Bitung. The results of interviews with teachers at SMP Negeri 4 Bitung will be used as a reference for product development in the form of flipchart media.

b) Material analysis

Material analysis aims to determine the material's content in the media to be developed. This material analysis is carried out by identifying what material will be included in the teaching material after the investigation. Identifying material that will be included in teaching materials is carried out by discussing (brainstorming) with science subject teachers. Then, the next step is to collect information about the materials needed by determining and collecting sources from books, journals, articles, and the internet as references in compiling teaching materials.

c) Analysis of learning objectives

Analysis of learning objectives is carried out to determine indicators of learning achievement based on material analysis so that researchers can find out what studies will be presented in teaching materials and limit the extent of development of teaching materials carried out.

2) Design Stage (Designing) Flipchart-based science learning media

Designing media to obtain initial results is the goal at the design stage. The media that will be developed is flipchart-based media regarding the human digestive system, which aims to be an alternative reference for students at SMP Negeri 4 Bitung and can also be used both

in class and outside the classroom, to increase knowledge and insight about the material on the human digestive system. There are four steps at this design stage, namely:

a) Preparation of questionnaires

This stage begins with preparing a questionnaire grid that the validator will give. As a result of this stage, a validation sheet is provided to media and material experts to determine the suitability of the teaching material or product to be developed.

b) Media selection

The media chosen was flipchart-based media on human digestive system material. This flipchart-based media was chosen for convenience for students. This media selection stage begins by designing an image of the digestive system using the Photoshot application.

c) Format selection

Format selection is a flipchart-based media content format, namely adapting to core competencies, basic competencies, and syllabi. In choosing this format, researchers collected material and pictures of the human digestive system from various reference sources, namely books and the internet, to be included in flipchart-based media. The application that will be used to design or create media is using the Photoshop application.

d) Initial design

The initial process of designing flipchart-based media is to use a device like a laptop or computer. Researchers used the Photoshop application to prepare or organize flipchart-based media on human digestive system material, which was installed first. The resulting design was in the form of an image.

3) Develop stage (development) Flipchart-based media for material on the human digestive system

After the product design is complete, the flipchart-based media for human digestive system material is assessed by experts by testing the suitability of the media through the media expert and material expert validation stages. The assessment of these experts is important to achieve the goals that researchers want to complete in this research and development. In this case, media experts and material experts are needed, which can be described as follows:

a) Material Expert Assessment

After the learning media has been created, there will be an assessment or validation from the material expert. At this stage, the validator can assess the material in the flipchart-based media that has been created and provide feedback regarding

improvements or if the material is valid and worthy of being tested in the material expert's assessment. 2 aspects are used as a reference namely the first is the learning aspect.

The learning aspect is assessed to determine whether the basic competencies used follow the material taught. Secondly, the content aspect is used to determine the clarity of the material and its delivery. The evaluator for the material expert is Dr. Nonny Manampiring, M.Si a lecturer who has mastered the human digestive system and holds courses related to animal structure. The selection of lecturers to become material experts can consider the conditions that must be met, and the assessment itself can be studied in the questionnaire given, including a Likert scale with five answer parts: 1, 2, 3, 4, and 5.

Material expert validation is carried out so that each component that includes learning will have suitability and a broader understanding regarding the basic competition used, learning objectives, language suitability, clarity of material, and so on to produce valid media. From the questionnaire table, which consists of 14 indicators, a score of 56 was obtained from the highest score of 70. By carrying out a calculation analysis using a calculation formula, the average score was 80% so that it could be categorized as worthy of testing.

b) Media Expert Assessment

Media expert assessments are carried out to see the quality of the flipchart-based media displayed, and must pay attention to the important parts contained in the flipchart media. Includes image display, text display, writing placement, language used, colors in images in flipchart media, and relating it to student responses. With the provisions on the aspects above, revisions/improvements will be visible, which will be used in the development of flipchart media later.

Media expert validation was carried out by Enci Dr. Femmy Kawuwung, SP, M.Si, a lecturer competent in media development and who teaches several related courses. Considerations in selecting a media expert validator are based on the background and abilities of the validator. The questionnaire uses a Likert scale with five section options, namely 1,2,3,4 and 5. With the information 5 = Very good, 4 = good, 3 = fair, 2 = not good, and 1 = very poor.

From the results of the media expert's validation of the assessed aspects, a score of 56 out of 14 indicators was obtained, resulting in an average media expert assessment result of 80%, calculated following the assessment criteria and categorized as very good.

Of course, the assessment above for flipchart media, which received a result of 80% in the category suitable for use, has been revised once by providing the flipchart

media via e-mail, which media experts gave at the meeting to show flipcharts as a learning media that is being developed. So, the first revision stage was carried out, with media experts providing suggestions and comments via e-mail.

The comments and comments given on flipcharts as a learning medium are as follows:

1. The displayed image is too small
2. The text displayed is too small

After providing suggestions and comments, the flipchart was revised as a learning medium by following the improvements made to the press above. Media display after revision as a fix:

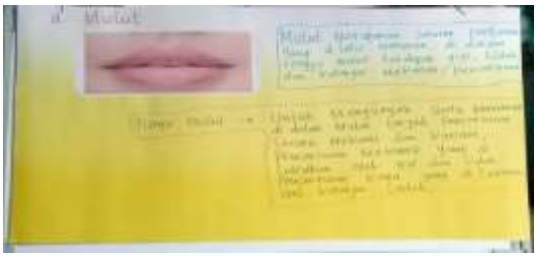

Figure 1. Image display on flipchart

Based on suggestions and comments from media experts, improvements were made to the image regarding the digestive system material, which was previously smaller and then changed to a larger size.

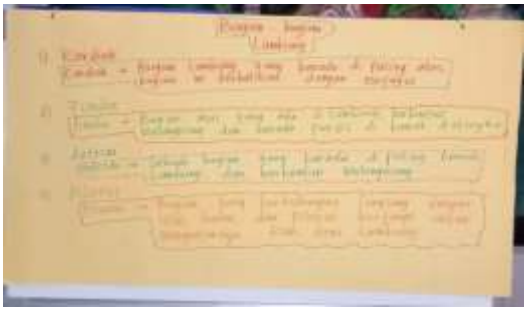

Figure 2. Writing on flipchart media

Based on suggestions and comments from media experts, revisions were made to the text size used. Previously, the writing was too small, replaced by a larger report.

c) Teacher Assessment at SMP Negeri 4 Bitung

After validating material and media experts, it was continued with validation from science subject teachers, especially those competent in assessing flipcharts as a learning medium, regarding material on the human digestive system. Apart from evaluating the appearance of the material and media, one of the teacher's assessments is also to determine the suitability of basic competencies and learning objectives with the subject matter applied in the media.

At SMP Negeri 4 Bitung, the teacher who is the validator for this flipchart media is Mrs. Sulastri Zaman, S.Pd, a teacher who teaches science lessons and is competent in assessment.

Following the validation by study teachers in the questionnaire/questionnaire assessment criteria displayed above, flipcharts, as a learning media developed, can be categorized as very suitable for application in learning. The assessment from the study teacher received 42 points out of the highest point of 50. Using the calculated product feasibility data formula, an average result of 84% was obtained in the very feasible category.

4) Dissemination stage (distribution) of flipchart-based media for material on the human digestive system

The researcher carried out this stage using limited distribution due to the limitations of the researcher. This flipchart-based media is created as a clipboard and then applied.

The trial stage for students at SMP Negeri 4 Bitung was carried out on September 19, 2022. This limited trial was specifically for class VIIIC Semester 1. Before the trial stage, the developer or researcher explained the activities flow. That is, the first activity is given preTest questions as the initial assessment results. Then, we continued with the second activity. Namely, students were allowed to see material on the human digestive system on the flipchart media being developed. They followed the third activity, providing student worksheets (LKS) as a form of assessment. The fourth activity is given post-test questions as a form of comparison, namely after studying flipchart media.

Figure 3. Applying flipchart media

The product trials' results were to determine the feasibility of the flipchart media being developed. Providing several written tests such as pretests, posttests, and student worksheets (LKS) will further increase the validity of the media being developed. The pretest and post-test questions consist of 10 multiple-choice and three essay numbers. Data on pretest and posttest results from students can be presented in the table below:

Table 1. Pretest and posttest assessment results

No	Student	Score	
		Pretest	*Posttest*
1	Chirey Ense	67	83
2	Chlara Kalensang	69	89
3	Risty Balaati	70	84
4	Albar Laode	65	84
5	Julio Daud	55	90
6	Dhea Difu	45	89
7	Afride Mananeke	57	92
8	Sintya Tampone	48	92
9	Muslima Darea	50	88
10	Natasya Dora	65	89

The data presented in the table above shows that the comparison between the posttest results is better than the pretest results. So, in trials with students, the media that is being developed can be used and can increase students' learning scores.

B. Product Feasibility Test

At the development stage, you can go through the product validation stage, namely by collecting questionnaire/questionnaire data from various validators such as lecturers who are material experts and media experts, then continue with validators from competent teachers, then the statements or results from the experts are as follows:

1. Eligibility of material experts

   Validation of material experts is studied in questionnaires filled out by material experts regarding the suitability of basic competencies and clarity of subject matter, getting a score of 80% in the very good category. In the questionnaire, there are weights consisting of 14 indicators.

   In material expert validation, product revisions are not carried out. Thus, a guarantee from material experts regarding learning media can be concluded as suitable for application in the learning process.

2. Eligibility of Media Experts

   Product feasibility testing from media experts is carried out in stages, namely the first, showing the flipchart media to media experts via WhatsApp that has been provided. The media experts offer comments and suggestions for improvement.

   Product revisions from media experts are carried out once. After modifications were made to the product being developed, a second stage assessment was carried out by providing an assessment questionnaire consisting of 14 indicators. The results of the second assessment stage by media experts showed that the results for the flipchart media being developed were 80% and very good.

3. Eligibility by Field of Study Teacher

Validation by field of study teachers was carried out at SMP Negeri 4 Bitung. The questionnaire given to the area of study teachers consisted of 10 statements.

At the assessment stage, the teacher himself assesses important aspects related to the suitability of the basic competencies applied to the material in the flipchart media, the learning objectives that must be achieved, the practicality of using the media, and the presentation of the material presented clearly. The assessment questionnaire for teachers in the field of study at SMP Negeri 4 Bitung obtained results using a calculation scale, namely 84% in the very good category and suitable for application in the learning process.

4. Test the students

After the questionnaire assessment for material experts, media experts, and subject teachers was carried out, it was then continued with the student trial phase. Trials on students were carried out at SMP Negeri 4 Bitung, with each test carried out on 10 to 20 students. This stage was carried out to determine the flipchart media results. The results of using flipchart media in learning activities by giving written tests to students showed that it influenced students' comprehension ability to understand the digestive system material and could also influence their grades.

B. Discussion

This research aims to produce flipchart media and also determine the feasibility of flipchart media. Flipchart is a print media that is very simple and quite effective. It is simple in manufacturing and relatively easy to use, using paper materials that we can easily find around us.

Flipchart media presents a summary of images, concepts, and charts. Flipcharts consist of several chart sheets clamped at the ends to ensure that students understand the learning material. Flipchart media can present any information and make it easier for students to play a more active role in learning. The learning outcomes of students can improve, and learning becomes more effective.

The material used by researchers in flipchart media is the human digestive system. The correct selection of learning models and media impacts students, especially learning that makes students more active, creative, and able to work together in the learning process. As explained by Sumantri and Permana (2017), Flipchart as visual media has a function: providing information symbolically, clarifying, and making it easier for students to capture complex

quantitative data. Also, this media can clearly describe an event or object's growth and development. So that students can be more systematic in learning a science.

The process of developing flipchart learning media was developed using Research and Development research and development methods. This research is research that aims to produce a product and test the effectiveness of the product. To make a product, the researcher uses seven stages.

The first step that the researcher took was to collect information; collecting information was carried out by studying literature, including the curriculum, syllabus, and books related to the human digestive system, and field studies, including interviews with science subject teachers using questionnaires. Observations were also carried out on subject teachers and students to obtain information. By conducting interviews, words, and questionnaires, researchers received information that there needed to be more learning media used in the learning process at SMP Negeri 4 Bitung. This was also done by researchers Rusilowati et al. (2016), namely using R&D research methods and conducting analysis. After conducting research and gathering information, the results were that SMP Negeri 4 Bitung needed flipcharts as a biology-based learning medium that could support material on the human digestive system to cover existing theories at the school.

The next stage is planning. Planning is carried out to carry out research in detail using specific information obtained through the steps that have been carried out previously so that planning can be prepared well. This stage was strengthened by researchers Mawarni et al. (2014), who carried out the planning stage.

Planning was based on the initial product created and the data obtained. The researcher developed a flipchart as a learning medium for material on the digestive system in humans at SMP Negeri 4 Bitung class VIIIC as follows: Determine the material. The material is arranged based on the objectives, competencies, and learning indicators developed. The suitability of the material packaged and the goals, competencies, and arrows is a guarantee for achieving the expected learning outcomes and student activity.

Then, create the image: design the image using Photoshop, choose an interesting image, and complete the pictures related to the human digestive system. Then, determine the paper size: the paper size is determined based on the wood and Flipchart backing board size. Then, print the image: print the painting according to the required size. Then, attach the board or flip, attach the banner paper to the flipchart board using paper clips, and use it by turning it over in sequence according to the learning material.

After planning the flipchart media, the third stage is to develop the initial product with the results of the flipchart product at an early stage before being validated by each expert. The first picture explains the parts of the mouth, and the second describes the various types of teeth found in humans. Then, the third picture explains the tongue, the fourth picture explains the esophagus and the parts in the throat, the fifth picture explains the ventriculus or stomach, the features that make up the stomach, and the sixth picture explains the small intestine. These parts are in the small intestine. The next picture is the large intestine, the meaning of the large intestine, the features that make up the large intestine, and the last picture, namely the anus, explains the function of the anus and the parts of the anus.

The results of initial product development are validated by carrying out the fourth stage, namely initial field testing or product distribution to schools. A product is said to be good if experts state that the product is categorized as feasible or very feasible according to the characteristics of each research. Validation was carried out with experienced experts to assess the learning media that researchers had created, and the suggestions given were used to improve the media and material design for the human digestive system that had been prepared. Validation sheets are used to determine the suitability of learning tools based on expert assessments.

Media Expert Validation: media expert validation is carried out to fill in the assessment questionnaire sheet for each aspect. The assessment consists of 2 elements. There are several statements in each part which media experts will fill in. The media expert lecturer was Dr. Femmy Kawuwung, SP, M.Si, a lecturer who is competent in media development and teaches several animal structure courses. From the results of the media expert's validation of the aspects assessed, they received a score of 56 out of 14 statements, resulting in an average media expert assessment result of 80%, which has been calculated following the assessment criteria and can be categorized as suitable for use.

Then, Material Expert Validation, a validity test from material experts, aims to determine the criteria for learning planning, presentation of learning material, and learning evaluation. The evaluator for the material expert is Dr. Nonny Manampiring, M.Si a lecturer who has mastered the human digestive system and holds courses related to animal structure. After carrying out the assessment, what things need to be revised is known. The evaluation from material experts, namely from the questionnaire table consisting of 14 indicators, obtained a score of 56 from the highest score of 70, so by carrying out calculation analysis using a calculation formula, the average score was 80% so it could be categorized as suitable for use, this shows that the total score for each aspect is quite decent.

After the product or flipchart media has completed the validation stage by media expert lecturers and material expert lecturers, the product is then given by the science subject teacher to determine the educator's response to the product being developed—the results of the reactions of science subject educators to the products produced. Following validation by subject teachers, it can be said that flipcharts, as a learning media developed, can be categorized as very suitable for application in learning. The assessment from the subject teacher received 42 points out of the highest point of 50. Using the calculated product feasibility data formula, an average result of 84% was obtained in the very feasible category.

The sixth stage was carried out after the product was revised for the main field trial. The test subjects were students in class VIIIC at SMP Negeri 4 Bitung. Field trials were carried out with small-scale trials, in these small-scale trials using 5-20 students in the class. Based on the results of small-scale product trials, 80% was obtained with feasible criteria. The test aimed to determine students' responses to flipcharts as a biology-based learning medium on the human digestive system. In carrying out the trial, the first step taken by researchers was to introduce flipchart media to students. Researchers then used it in the classroom learning process and then provided a questionnaire assessing students' responses to the product being developed.

The seventh stage is to revise the product. Product development revisions are conclusions drawn from data analysis about products being tested as a basis for determining whether a product needs to be changed or not, and from this research, the developer makes revisions to the flipchart media design. The results of the revisions are the final product of flipcharts as a biology-based learning medium for class VIIIC students. The flipchart media has been developed, and the media has been tested for suitability and usage so that flipcharts, as a biology-based learning media, can be used as a learning media for students. Flipchart is a biology-based learning medium for SMP Negeri 4 Bitung class VIIIC students.

Thus, flipcharts as a biology-based learning media have two development aspects: design and material. In terms of design, the appearance is attractive, with varied colors and images presented sequentially. Feasibility After being validated by each expert, media experts score 80% in the feasible category. Material experts get 80% in the appropriate variety so that flipcharts can be categorized as suitable for use, and the subject teacher's response to flipcharts as a biology-based learning media gets a score—84% in the very feasible category. Students' responses to flipcharts as a biology-based learning medium at SMP Negeri 4 Bitung received a score of 80% in the adequate category. The research results concluded that flipcharts, as a biology-based learning medium on the human digestive system, are very suitable for use as a learning medium for students in class VIIIC at SMP Negeri 4 Bitung.

CONCLUSIONS

Based on the results of research on the development of flipchart products as a learning medium that has been carried out, it can be concluded as follows: The use of flipcharts as a learning medium developed according to the research and development method Research and Development) using the 4-D model, namely define (analysis), design (planning), develop (development), and disseminate (trial), can improve learning outcomes and student activity, especially for students grades on human digestive system material, and teachers are more motivated to use flipchart media.

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