



Leaflet-Based Learning Media Development in Structural Materials and Function of Class XI Animal Tissues

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ABSTRACT

The use of instructional media, especially visual media, is very influential in student learning and learning outcomes. The teacher can develop visual learning media so that students can learn well fun and attract learning interest. Experts say that approximately 90% of one's learning outcomes are obtained through vision, 5% from hearing, and 5% from other senses. Development research aims to produce a valid leaflet-based learning media so that it is fit for use by students. This type of research was adapted from Tessmer's design, through the preparation stage (preliminary) and formative evaluation (formative evaluation) with stages only to self-evaluation, and expert testing. The expert opinion includes 3 validators according to expertise. Data was obtained from research instruments in the form of content/material validity evaluation sheets, and construct validity. Data collection techniques using assessment sheets. Analysis of data validity based on the Akbar category (2013). Based on the research results of the first meeting leaflet, the content validity value was 92.05%, and the construct validity was 98.61%. The second meeting leaflet obtained content validity value 92.65%, and construct validity 97.45%. So it was concluded that the learning media of the development leaflet was categorized as very valid.

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A. Introduction

The teacher is one of the determinants of the quality of education, namely the use of media in the learning process. Teachers can directly interact with students; therefore teachers are the key to the success of the learning process that can improve the quality of education. Zuhriyah (2016) explains the quality of education is influenced by the education system, curriculum, educators, learning methods, and the media used in learning.

Most learning in schools still uses conventional methods. Supported statement by Susilo (2015) at this time the learning media is needed because of its existence to

support the learning process. Some facts about the monotonous learning process due to the absence of instructional media and the lack of creativity of educators occur in several schools both junior and high school levels. Experts say that about 90% of one's learning outcomes are obtained through vision, 5% of hearing, and 5% of other senses (Arsyad, 2011). This shows that the use of instructional media, especially visual media, is very influential for student learning. The teacher can develop visual learning media so that students can learn well, have fun, and attract their learning interest.



The word media comes from the Latin "medio" in Latin the media is interpreted as between. Media is a plural form of medium that means an intermediary or introduction. Specifically, the word can be interpreted as a communication tool used to carry information from one source to the recipient. Associated with learning, media is defined as a communication tool used in the learning process to bring information in the form of teaching material from the teacher to students, so students become more interested in participating in learning activities (Kustiawan, 2016).

Learning media is one of the tools used by teachers to help the learning process in the classroom. To be more attractive to students' learning interests, teachers are expected to be able to design or create innovative learning media. According to Sumiharsono and Hasanah (2017) there are six main functions of learning media in the teaching and learning process, among others: (1) The use of learning media in the teaching and learning process is not an additional function but has its function as a tool to realize effective teaching and learning situations; (2) The use of learning media is an integral part of the whole teaching situation; (3) Learning media in teaching is integrated with the aims and contents of the lesson; (4) Media learning in teaching is not merely an entertainment tool or not just a supplement; (5) Learning media in teaching is preferred to speed up the teaching and learning process and assist students in capturing the understanding given by the teacher; (6) The use of learning media in teaching is prioritized to enhance the quality of teaching and learning. Added by Jalinus and Ambiyar (2016) which states that learning that learns by listening alone will differ in their level of understanding and the duration of "memory" persisting, compared to learning that learns through seeing or simultaneously listening and seeing. Learning media are also able to arouse and bring learners into an atmosphere of pleasure and joy, where there is emotional and mental involvement.

Developing learning media needs to be considered the VISUALS principle which can be described as an abbreviation of words; Visible (easy to see), Interesting (interesting), Simple (simple), Useful (useful/useful contents), Accurate (true/accountable),

Legitimate (reasonable/legitimate), Structured (structured/ well-structured) (Nurseto, 2011).

One of the print learning media is leaflets. According to Simamora (2009) leaflets are a media in the form of a piece of paper that is given pictures and writing (usually contains more writing) on both sides of the paper and folded so that it is small and practical to carry. Leaflets are usually A4-sized, three folded. This media contains ideas on the subject matter directly and describes how to take a concise, straightforward action. Leaflets are very effective in delivering concise and concise messages.

Leaflets contain concise material using language that is easy to understand and contains attractive colour images according to the material so that it is expected to attract student learning interest. According to Lubis (2018) leaflets contains material that is simple, concise, and not complicated to carry anywhere, not only contains writing alone, but there is a design in the form of explanatory drawings. Excess leaflets according to Maulana (2017) interesting to see, easy to understand, stimulates the imagination in understanding the contents of the leaflet, and more concise in the delivery of information content.

Based on the results of observations for three months while doing practical teaching exercises it is known that the students of class XI MIPA at SMAN 5 Banjarmasin want a short learning media (containing summaries) accompanied by colour pictures to make it easier to remember and interesting to read, because according to students the explanation of the material in the reading books are too long and not very interesting, besides the Biology learning process, most teachers use the media, as usual, that is the LCD-assisted PowerPoint (PPT) which contains more sentences than pictures or other illustrations, which makes students bored with the learning process and lazy to record learning material. Based on this fact, researchers intend to develop leaflet media as one of the media that helps the learning process of students in class on the material structure and function of tissues in animals.

B. Materials and Methods

This type of research is development research (Development Research) with two stages, namely the phase of preparation (preliminary)

and formative evaluation from. Tessmer's formative evaluation in this study is limited to the self-evaluation and expert review stages. This research was conducted during one semester of the 2019/2020 school year.

The research subject for validation at the expert review stage consisted by (1) a lecture who expert in the field contents and materials of the leaflet media; (2) a lecture who expert in the constructs of the leaflet media; and (3) a biology teacher at as practitioner (validating the contents in the leaflet).

Data on the results of media validity were obtained from the material and construct validity assessment sheets. Validity data collection techniques and by giving a score (1 = not good, 2 = good enough, 3 = good and 4 = very good). The validity data analysis technique uses the Akbar formula (2013) as follows:

$$V = \frac{TSe}{TSh} \times 100\%$$

Information:

V = Validity

TSe = Total validation score from the validator

TSh = Expected maximum total score

Then adjusted to the validity category 85.01%-100.00% (very valid), 70.01%-85.00% (quite valid), 50.01%-70.00% (less valid), and 01.00%-50.00% (very less valid) (Adapted from Akbar, 2013).

C. Results and Discussion

The learning media for the leaflet is an educational leaflet containing Biology material about the structure and function of animal tissues whose contents are adjusted to the learning objectives based on Basic Competencies in the 2013 Curriculum. Leaflets are made with Microsoft Office Publisher 2007 because it is easier to arrange and position text and images according to the specified paper size. A4 paper size (21 cm x 29.7 cm) and tripled. Leaflets that are made have four main components/structures namely; title, learning indicator derived from KD 3.4 Applying the concept of the relationship between the structure of cell structures in animal tissue with organ functions in animals based on observations, the subject matter added supporting information, and further work. The subtopics in the leaflet are epithelial tissue, muscle tissue, connective tissue, and nerve tissue which are divided into two meetings so that there are two leaflets to discuss the structure and function of the tissue in animals. Leaflets that are made contain a summary of the material accompanied by a colour image.

Media validity can be seen from the results of the validation of the material and the contract. The results of the validation from the experts are used as material for the revision/revision of the leaflet media based on the advice and instructions that have been given. The improved leaflet will be re-assessed by the validator according to expertise until the results are very valid. The results of the revised media leaflet can be seen in the following table 1.

Table 1 Average Percentage Result of Expertise on Leaflet Material

No	Validated Aspects	First Meeting Leaflet	Second Meeting Leaflet
1.	Relevanced	97,50	97,50
2.	Accuracy	93,75	93,75
3.	Completeness of presentation	93,75	93,75
4.	The suitability of the presentation with the demands of student-centered learning	96,88	96,88
5.	Serving method	87,50	87,50
6.	The suitability of the language with the rules of Indonesian language is good and right	83,33	87,50
7.	Readability and communicability	91,67	91,67
Average (%)		92,05	92,65

Information:

The validation category is 85.01% -100.00% (very valid), 70.01% -85.00% (quite valid), 50.01% - 70.00% (less valid), and 01.00% - 50.00% (very less valid) (Adapted from Akbar, 2013).

Table 2 Data Recapitulation of Interpersonal Skills and Intrapersonal Skills of Students

No	Validated Aspects	First Meeting Leaflet	Second Meeting Leaflet
1.	Leaflet Size	100,00	100,00
2.	Leaflet Cover Design	97,92	95,83
3.	Leaflet Contents Design	97,92	96,53
Average (%)		98,61	97,45

Information:

The validation category is 85.01% -100.00% (very valid), 70.01% -85.00% (quite valid), 50.01% - 70.00% (less valid), and 01.00% - 50.00% (very less valid) (Adapted from Akbar, 2013).

Table 1 show the content validity for the first meeting leaflet which obtained a percentage value of 92.05% and the second leaflet 92.65% so that it is categorized as very valid. The results of construct validation can be seen in table 2. The percentage obtained for the first meeting leaflet was 98.61% and the second leaflet was 97.45%. The percentage shows the results of the validation of the media construct by the validator in the very valid category.

The development of instructional media must include an assessment of the validity of the product to be developed. So, that the

contents or constructs of the media are made accurate and suitable for use by the target in the learning process. According to Hafiz (2013), validity is a measure that shows the level of validity of a product that has been developed by referring to several aspects of assessment. Two aspects are required so that the media is said to be valid, namely: (1) Content validation, if the product being developed has an adequate theoretical basis; (2) construct validation, if all product components are related to one another consistently.

Table 3 Follow-up Recapitulation of Validator Suggestions

Aspect	First Meeting Leaflet		Second Meeting Leaflet	
	Before	After	Before	After
Fill out/Material of the Leaflet				
Completeness of Leaflet Serving	- There are no indicators yet	- Added indicators according to KD	- There are no indicators yet	- Added indicators according to KD
	- Has not yet presented benefits to student life	- Added benefits for student life	- Has not yet presented benefits to student life	- Added benefits for student life
Readability and Communicative Leaflets	- Improve words and punctuation	- Improved words and punctuation	- Add the location of cartilage tissue based on the matrix	- Has been added in the form of assignments
	- The base color of the column is too striking	- The base color of the column has been changed	- The base color of the column is too monotonous	- The base color of the column has been varied
Media Leaflet				
Leaflet Cover Design	- Background title interferes with legibility of writing	- Background title has been fixed	- Background title to make it more transparent	- The title background has been improved to be more transparent
Leaflet Contents Design	- The beginning of the paragraph does not consistently go inside	- The beginning of the paragraph fixed consistently goes inside	- Improve the layout of the images in the leaflet	- The layout of the images in the leaflet has been improved
	- Distinguish letter sizes between titles	- Font sizes have been distinguished	- The size of the letters in the caption should	- The font size in the caption has

Aspect	First Meeting Leaflet		Second Meeting Leaflet	
	Before	After	Before	After
	and subtitles	between titles and subtitles	not be the same as the size of the letters in the contents of the leaflet	been distinguished from the font size in the contents of the leaflet
	- There needs to be a proper spacing between pictures and paragraphs	- Has been given the appropriate distance between images and paragraphs		

The results of validation and suggestions from the validator serve as guidelines for revising/correcting product deficiencies. According to the validator on the completeness aspect of the presentation leaflets, one and two meetings still do not contain indicators, benefits in student life and not explained the location of cartilage tissue based on the matrix. This input is used as a reference for the improvement of the next leaflet which can be seen in Table 1. According to Pangestika, et al. (2013) a learning dish can run optimally if there is the suitability of competency standards, basic competencies, completeness of material selection, there are examples of the application of concepts, there are practice questions for the deepening of concepts, the existence of evaluation tools and feedback on the success of learning that has been carried out. To achieve success in learning, it is necessary to have a match between components in a learning dish that is integrated with an appropriate learning model.

According to the validator aspects of readability and communicative aspects need to be improved words and punctuation, as well as the colors used in the writing column so as not to disturb the readability of the sentence. According to Meldasari (2018) readability is one of influenced by the contrast of the color of the letters with the background color used. Although the use of color functioned to provide certain vibrations in the delivery of messages (vibrations in a design), but the power of color can have a psychological effect on everyone who sees it. According to Ramadhan (2016) in the context of readability, the use of color can help the delivery of messages expressed in learning, but if the color used to provide a "psychological effect" that requires more concentration then learning will not be conveyed because concentration will lead to

reading alone. In line with Hall and Hanna (2004), that colors with a greater contrast ratio generally lead to greater readings.

The revised leaflet based on the results of the validation and suggestions from the validator was returned to be re-evaluated for the validity of the contents/material and the construct of the leaflet media. Based on the data in table 1 for the validity of the material the first meeting leaflets had a percentage of 92.05% and the second meeting leaflet was 92.65%. The percentage is an average value of 7 aspects assessed in the material namely; relevance, accuracy, completeness of the presentation, the suitability of the presentation with the demands of learning, the way of presentation, the suitability of the language with good and correct Indonesian language rules and readability and communicability. For the percentage of media construct validity can be seen in table 2 the results are 98.61% first meeting leaflet and the second meeting leaflet have a value of 97.45% which is the average value of the three aspects assessed namely size, cover design, and leaflet content design.

Based on the percentage value shows the leaflet media both content/material and the revised media construct into a very valid category so that it is fit to be used as a biology learning medium for high school class XI material structure and function of animal tissue. Development leaflets that are judged to be valid can be tested for practicality to determined students.

D. Conclusion

Leaflet-based learning media as a result of the development are categorized as very valid so it is suitable to be used as a learning medium Biology material structure and function of animal tissue class XI high school.



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