

The Biology Skill Cabinet (Lentera Bio) Respiratory System: A Valid, Practical and Effective for Development Learning Media

Sri Riska Ramadani¹, Andi Tenri Ola Rivai², Hamansah³

^{1,2,3}Sri Riska Ramadani, Andi Tenri Ola Rivai, Hamansah

Fakultas Tarbiyah dan Keguruan, UIN Alauddin Makassar

Author Correspondence Email: andi.tenriola@uin-alauddin.ac.id

ABSTRACT

This research is a study in Research and Development (R&D) aimed at creating and evaluating the Biology Skill Cabinet media (LENTERA BIO) for its validity, practicality, and effectiveness. The ADDIE development model, which includes the stages of analysis, design, development, implementation, and evaluation, was used for this project. The media was assessed through three tests: validity, practicality, and effectiveness. The research instruments used are validation sheets to determine the level of validity of the product to be developed, student response questionnaires and educator response questionnaires to determine the practicality of the product, and learning outcomes tests to determine the effectiveness of the product to be developed. The study involved 32 students from class XI IPA at SMA 2 Jeneponto. The results indicated that the media achieved a validity rating of 3.5 very valid, a practicality rating of 3.7 very practical based on teacher feedback, and a practicality rating of 3.4 very practical based on student feedback. Additionally, the media demonstrated effectiveness with a learning outcomes score of 97% and an average test score of 84.3, confirming its suitability for use.

Keywords: ADDIE, Learning Media Development, LENTERA BIO Media, Human Respiratory System.

1). INTRODUCTION

The development of human civilization is closely related to education, because one of the important tasks of education is to develop human civilization itself. The changes that occur in human civilization are proof that education has a very important role in life. Education is also one of the aspects that distinguish humans from other living things. Humans prepare the next generation by providing good education so that the next generation is better than the previous generation. Education has a great influence in determining the nature of every human being, with education human life is more directed (Triwiyanto, 2014).

Education is a person or group who endeavors to make other people mature so that they reach a higher level in life. The meaning of “adult” means being able to carry out personal responsibilities

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Faculty of Teacher Training and Education
Universitas Islam Negeri Alauddin Makassar
South Sulawesi-Indonesia

biologically, psychologically, pedagogically, and sociologically (Afifuddin Harisah, 2018). Furthermore, Education is a structured and scheduled activity that provides opportunities for students to gain real experiences that enhance their understanding of concepts and improve their learning skills (Syahriani et al, 2022).

Learning is also defined as an effort to change behavior that brings changes to a person. These changes can include various kinds of knowledge, such as skills, attitudes, and interests. Educators or teachers act as teachers who aim to provide extensive knowledge to students who are expected to apply the knowledge provided (Wirawan, 2001).

Learning media development involves efforts to discover, design, and implement effective methods to create new knowledge and specific learning settings. The process of creating learning focuses on knowledge acquisition and enhancing the learning experience (Andi Tenri Ola Rivai et al, 2021).

Teaching aids are instruments used during the teaching and learning process. Teaching aids consist of two types, namely two-dimensional and three-dimensional, such as posters, maps, globes, torsos, and sculptures. Used as a product in learning media to deepen students' understanding of the subject matter (Hamansah and Muhammad Danial, 2013)

Media is an intermediary or introduction, in other words, the media itself can be interpreted as a communication tool that helps teaching staff to convey material in order to stimulate students in learning. With this learning media, it is possible to disseminate the knowledge to be conveyed, can stimulate students' thoughts, feelings, attention and willingness to learn (Cepi Rinaya, 2012).

Teachers know that if there is no media that helps the learning process, it will be very difficult for students to accept and understand learning, especially material that is difficult to understand. Therefore, the use of media as a tool to facilitate the learning process is very important. Creative and innovative media is needed to increase effectiveness in learning, this aims to make learning not seem monotonous, less interesting and boring.

Based on the results of interviews with teachers at SMAN 2 Jeneponto and students, they said that there are several problems that occur 1) The use of learning media in schools tends to be more dominant using media such as books, modules and student worksheets (LKS) in the learning process in class. 2) Learning media such as torsos in schools are no longer adequate as teaching materials because many anatomical parts of the organs are missing. 3) Student learning outcomes are still low.

This finding is in line with (Abidin, 2017), Selection of learning media is to choose interesting learning aids and ensure the right type of media to use, because the selection of learning media can affect the effectiveness of learning.

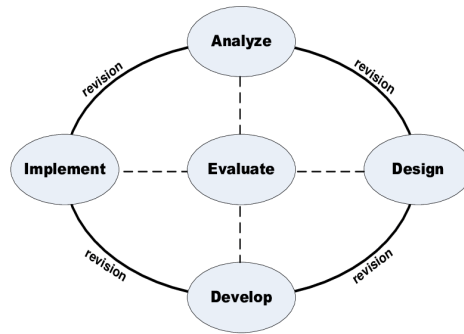
Researchers are motivated to develop an innovative media that can be applied to learning activities as a solution to the various problems described above and in accordance with student needs. Then, researchers also consider students' learning styles. By knowing students' learning styles, teachers can help students learn according to their learning styles so that students' learning achievements can develop well according to their learning styles (Widyanti, 2013). As a result, the researcher concluded that there is one media that is suitable and can be applied to overcome these problems. The learning media is LENTERA BIO media which is packaged in the form of Skilled Cabinet media containing a torso with the aim of making it easier for students to know the anatomical shape of the organs of the respiratory system and can see directly (visually) the shape of the respiratory organs in humans.

2). METHODS

This research employed the research and development method (R&D). The development model used was the ADDIE model, which consists of 5 stages: analyze, design, develop, implement, and evaluate (Robert Maribe Branch, 2009).

The analysis stage aims to understand current conditions and problems in the learning process by observing and interviewing educators and students. The design stage begins with arranging product development requirements, developing product development goals and developing a testing strategy. The product development stage begins to be created based on the results of the design stage. This stage involves expert validators to carry out the validation process. The results of the validation process show whether the product developed is in accordance with the learning process or not.

The next stage is implementation, which is a stage to implement the Biology Skill Cabinet (LENERA BIO) media which has been developed in real situations in the classroom. The evaluation stage was the final stage of the ADDIE development model. The aim of the evaluation stage is to determine the increase in students' abilities after applying the Lentera Bio media and to obtain product quality information for revision needs based on the evaluation results. The research design can be seen in picture 1.



Picture 1. ADDIE Development Model

Source: (Desi Listiani dan Erlina Prihatni, 2018)

This research was conducted at SMAN 2 Jenepono Kec. Tamalatea, Kab. Jenepono, South Sulawesi, with research subjects namely students of class XI IPA 1 SMAN 2 Jenepono, totaling 32 students. The research instrument used was the validation sheet to obtain validity data from experts. Also, a questionnaire about learning media was created and distributed to educators and students as respondents. Information from respondents was collected to measure the practicality of the products. Learning outcomes were used to determine the effectiveness of the developed media. The validity category is shown in Table 1.

$$\overline{Ai} = \frac{\sum_{j=1}^n Kij}{n} \text{ (Suryo Hartanto, 2020)}$$

Information:

\overline{Ai} = The average aspect of the i

Kij = The average for the i-th aspect

n = Many assessors

Table 1. Validity Criteria

Value	Criteria
$3,4 < V \leq 4$	Very valid
$2,8 < V \leq 3,4$	Valid
$2,2 < V \leq 2,8$	Valid enough
$1,6 < V \leq 2,2$	Less Valid
$V \leq 1,6$	Invalid

The media practicality test can be measured based on the teacher and student response questionnaire analysis results. The practicality category can be seen in Table 2.

$$\bar{X} = \frac{\sum_{j=0}^n Ai}{n} \text{ (Almira Keumala, 2022)}$$

Information:

\bar{x} = Total average

Ai = Aspect average

n = The number of aspects

Table 2. The Practicality Criteria

Value	Criteria
3,26 - 4,00	Very Practical
2,51 – 3,25	Practical
1,76 – 2,50	Practical enough
1,00 – 1,75	Not Practical

The media effectiveness test was measured based on student learning outcomes tests. Learning is said to be successful classically if at least 80% of students achieve a complete score. The effectiveness level category can be seen in Table 3.

$$N = \frac{B}{n} \times 100\% \text{ (Hobri, 2020)}$$

Information:

N = The value obtained by students

B = The number of correct

n = The number of questions

Table 3. The Effectiveness Criteria

Mastery Level	Category
$90 \leq \text{TPP} < 100$	Very effective
$75 \leq \text{TPP} < 90$	Effective
$60 \leq \text{TPP} < 75$	Effective enough
$40 \leq \text{TPP} < 60$	Less effective
$0 \leq \text{TPP} \leq 40$	Very Less Effective

The effectiveness of the developed learning media is analyzed through with the help of measurement data on student learning outcomes. Learners are considered successful (complete) if they achieve a value greater than or equal to the KKM value (value \geq KKM). Learning is said to be classically successful if at least 80% of students achieve a complete score.

3) RESULTS AND DISCUSSION

This study aims to develop a biology skill cabinet media (LENTERA BIO) that meets the criteria of valid, practical, and effective using the ADDIE model.

Media characteristics are obtained from the results of the assessment of the media characteristics sheet by the validator. This validation is carried out to determine the level of feasibility (Nofina M, 2022). The results and description of the validator's assessment of the characteristics of the Biology Skills Cabinet (LENTERA BIO) media can be seen in Table 4.

Table 4. Results of the Validator's Assessment of the Characteristics of biology skilled cupboard (LENTERA BIO)

Aspect	Rating Result	Category
Appearance	3,8	Very Valid
Media Contents	3,3	Valid
Technical Quality	3,6	Very Valid
Communicative Language	3,35	Valid
Average	3,5	Very Valid

After going through the design stage, prototype I can be obtained. Then the prototype that has been checked by the validator is then revised based on the suggestions and input given by the validator to obtain prototype II. The assessment results from prototype II validation are that the average value given by the two media validators is 3.5 which is in the very valid category.

first indicator from the appearance aspect, obtained an average value of 3.8 which is in the very valid category. The Biology Skill Cabinet (LENTERA BIO) has an attractive appearance because the shape and colors used are red and white and the images used are in accordance with the material of the human respiratory system. The color red is said to be a symbol of strength and creativity which can stimulate the human brain to increase self-confidence. The theory of color in its use in terms of health is that red can stimulate the nervous system and improve blood circulation (Rian Tasalim dan Lily Widy Astuti, 2021). The color white means clean, safe and pure, which has a positive connotation. The color white can also symbolize success, is often associated with light and can produce feelings of calm and comfort (Zuhriah, 2018). This is in accordance with the theory which states that the attractive display of teaching aids can increase students' motivation, eliminate boredom in learning, and increase students' understanding in the learning process (Badian Susanti, 2018).


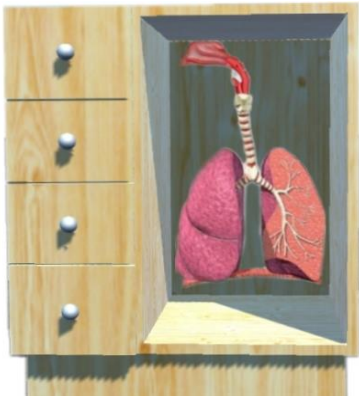

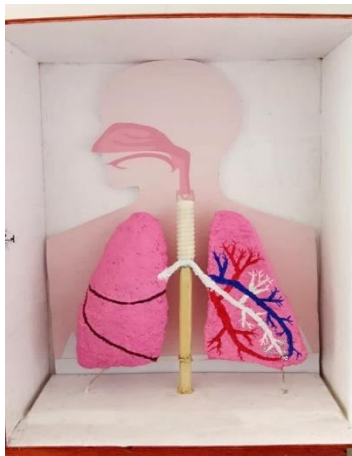
The LENTERA BIO media contents aspect obtained an average score of 3.3 which is in the valid category. This is in accordance with research conducted by Nida Jarmita with research results that media selection should pay attention to relevance to the material and cognitive abilities of students both visually, audio and audio-visual (Jarmita, 2020).

The technical quality aspect obtained an average score of 3.6 which is in the very valid category. This is in accordance with the theory which states that improving the quality of learning media can influence student achievement and learning outcomes during the learning process (Inesa Tri, 2018).

The aspect of appropriateness of communicative language obtained an average value of 3.37 which is in the valid category. The fourth indicator is that the use of terms or language used in the Biology Skill Cabinet (LENTERA BIO) media is in accordance with the writing rules and applicable regulations. This is in accordance with the theory which states that learning media must be easy for students to understand, where the terms and language used must use standard words, apart from that, foreign words must be italicized (Fahri Eka dan David, 2022).

Furthermore, the validation results and suggestions from the two validators are used as a reference in revising the product to produce prototype II. The comparison of the results of the prototype I and prototype II which were made based on suggestions and input from the two validators can be seen in Table 5.

Table 5. The Comparison between Prototype 1 and Prototype 2

Prototype 1 (Before Revision)	
	
Picture 1. Front view of LENTERA BIO media before revision	Picture 2. Appearance in LENTERA BIO media before revision
Prototype 2 (After Revision)	
	
Picture 3. Front view of LENTERA BIO media after revision	Picture 4. Appearance in LENTERA BIO media after revision

Based on the validation results obtained, The Biology Skill Cabinet (Lentera Bio) media developed meets the very valid category and can be tested with slight revisions, in accordance with the theory

put forward by (Sugiono, 2016) that if the learning media has an average validity value of $3.5 \leq V \leq 4$ then it can be said to be very valid. The Biology Skill Cabinet (Lentera Bio) developed is classified as very valid. This is in accordance with theory (Zaroah Dwi Fajrianti et al, 2017), if the average assessment score reaches the good category then the product being developed is considered valid and suitable for use.

LENTERA is an innovative media using a torso model of the human body's respiratory organs. Torso media is defined as a form of imitation (replica) of a real object, so that it has the same or similar shape or construction as the object being imitated or exemplified. When printed words on visual media cannot be conveyed clearly in conveying the content of information and knowledge about an object or object, an imitation model of a real object can fill this gap well. A torso is a model or prop in the form of a human statue with human organs, and an imitation model that provides optimal direct observation students regarding the location and size of actual body organs (Benny A. Pribadi, 2017).

There are several other factors, namely 1) learning media are able to motivate students to learn because learning media are developed according to the level of development of students, and 2) learning activities focus on students which can make it easier for students to rediscover a concept (Dwijayani, 2017). This is also in accordance with research conducted by (Desi Listiani dan Erlina Prihatni, 2018), that the learning media developed is in the very valid category due to the assessment of the material aspect and the learning media aspect.

The practicality of learning media is measured using research instruments in in the form of a questionnaire of student responses and teacher responses. Result of student and educator responses to biology skilled cabinet media (LENTERA BIO) is presented in the Table 6.

Table 6. Results of Educator and Student Response Questionnaires

Aspect	Educator	Student
Presentation Techniques	3,8	3,4
Media Convenience	3,8	3,3
Achievement of objectives Learning	3,7	3,5
Average	3,7	3,4

Category	Very Practical	Very Practical
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The results of the analysis of The Biology Skill Cabinet media questionnaire (LENTERA BIO) from the teacher's response, namely 3.7, was in the very practical category and the student response questionnaire, namely 3.4, was in the very practical category. In accordance with the practicality criteria, namely if the media has an average value of 3.26 – 4.00, which means the response is in the very high category so that the Biology Skilled Closet (LENTERA BIO) media can be said to be very practical to use in the learning process.

After carrying out learning activities in class, it is continued with giving teacher response questionnaires and student response questionnaires to be able to analyze the practicality of a media. The practicality of the Biology Skill Cabinet (Lentera Bio) media that has been developed is then measured using assessment instruments in the form of student response questionnaires and also teacher response questionnaires. The average result obtained on the student response questionnaire is 3.4 which is at a very practical level and the average result obtained on the teacher response questionnaire is 3.7 which is at a very practical level so that a learning media can be said to be practical. if the media has been used or applied by educators and students in the learning process (Magfirah Rasyid, 2017).

The practicality of a development product refers to users liking it and being able to use it easily under normal conditions (M. Haviz, 2013). In accordance with the opinion of (Muhammad Khalifah Mustami et al, 2019), which states that the practicality of a development product refers to aspects that enable educators and students to have an interest in the product and this interest is based on the ease of use of the product as a result of developing learning activities so that goals can be achieved.

Testing the effectiveness of products being developed can be carried out by making learning outcomes tests for students who have gone through the teaching and learning process using learning media created and developed by researchers. Researchers measured the effectiveness of learning media by giving a written test with multiple choice questions to 32 students of class XI IPA 1 SMAN 2 Jenepono. Test results and student mastery level classification can be seen in Table 7 and 8.

Table 7. Results of Educator and Student Response Questionnaires

No	Names	Learning Outcomes
1.	AH	86
2.	AA	90

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3.	APJ	93
4.	AA	80
5.	AM	86
6.	AS	96
7.	A	80
8.	A	80
9.	AMZ	80
10.	CAP	83
11.	DAS	83
12.	EAP	76
13.	HS	80
14.	IB	93
15.	IMIJ	76
16.	J	90
17.	MAS	83
18.	NDS	80
19.	MA	80
20.	MNAS	73
21.	NA	93
22.	NA	80
23.	NRF	83
24.	NA	90
25.	PA	86
26.	QADA	86
27.	RJ	83
28.	RPS	90
29.	RA	80
30.	SNA	80
31.	T	83
32.	W	96
Average		84,3

Table 8. Classification of Students' Mastery Levels

Score	Number Students	Category
$90 \leq \text{TPP} < 100$	9 People	Very Effective
$75 \leq \text{TPP} < 90$	22 People	Effective
$60 \leq \text{TPP} < 75$	1 People	Effective Enough
$40 \leq \text{TPP} < 60$	0 People	Less Effective
$0 \leq \text{TPP} \leq 40$	0 People	Very Less Effective

After analyzing the results of students' mastery levels, a classification of students' mastery levels was obtained by adjusting the students' scores in the classification table above. When described, it can be seen that the very effective category ($90 \leq \text{TPP} < 100$) consists of 9 people and the effective category ($75 \leq \text{TPP} < 90$) consists of 22 people. The students who did not complete were 1 person with a quite effective category, 1 person ($60 \leq \text{TPP} < 75$) and 0 students who had a less effective completion classification ($40 \leq \text{TPP} < 60$). Meanwhile, classification is very less effective ($0 \leq \text{TPP} < 40$) 0 students.

Learning is said to be classically successful if at least 80% of students achieve a complete score. The percentage of total student completion can be seen in the table 9.

Table 9. Percentage of Mastery of Science Learning Outcomes of Students

Score	Frequency	Percentage
75-100	31	97%
0-74	1	3%
Amount		100%

It can be seen that there are 31 students who have a score between 75-100 with a percentage of 97% and there is 1 student who has a score between 0-74 with a percentage of 3%. This means that there are 97% of students who have completed learning using the Biology Skill Cabinet (LENTERA BIO) media with a total average student learning outcome score of 84.3, which shows that the level of students' mastery of the material is in the (effective) category.

Based on the results obtained, it can be concluded that the Biology Skill Cabinet media (Lentera Bio) which has been developed by researchers is in the effective category seen from the number of students who get complete marks in the process of learning material on the human respiratory system. This is supported by research by (M. Haviz, 2013), which states that a development product is said to be effective if it provides results that are in accordance with the learning objectives shown in the students' learning outcomes test (Jeditia Taliak, 2020).

4). CONCLUSIONS

The research and discussion led to the following conclusions: (1) The process of developing the Biology Skill Cabinet learning media (LENTERA BIO) using the ADDIE. (2) The level of validity of LENTERA BIO media is in the very valid category with an average value of 3.5. (3) The level of practicality of the media is in the very practical category with a teacher response questionnaire score

of 3.7 and a student response questionnaire score of 3.4. (4) The level of effectiveness of LENTERA BIO media is in the effective category, the percentage of student learning completeness reaches a value of 97% with an average student learning outcome value of 84.3.

Based on the results of this research, the theoretical and practical implications can be stated as follows:

1. For students, using Biology Skill Cabinet Media (LENTERA BIO) can more easily remember and understand the material and can help students to get maximum grades.
2. For educators, it can be a guide and reference for using appropriate learning media. Learning using Biology Skill Cabinet (LENTERA BIO) can increase interest in learning and increase students' understanding in learning process activities.
3. For future researchers, it can increase insight and knowledge about effective teaching procedures that are in accordance with the wishes of students.

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