

Development of PowerPoint (PPT) Based Learning Media Using Morph Animation on the Circulatory System Material for Grade XI Students at SMAN 10 Bulukumba

Akram Caesar Maulana¹, Ummul Hasanah², Syahrhani³

^{1,2,3}Universitas Islam Negeri Alauddin Makassar

Email: akramcaesar13@gmail.com

ABSTRACT

This study aims to develop PowerPoint (PPT) based learning media using Morph Animation on the circulatory system material for Grade XI students at SMAN 10 Bulukumba that is valid, practical, and effective. This research employs a research and development (R&D) approach using the ADDIE development model (Analyze, Design, Development, Implementation, Evaluation). The developed product was tested through validity, practicality, and effectiveness tests. The subjects of this study were 36 students from class XI.7 of SMAN 10 Bulukumba. The results showed that the PowerPoint (PPT) based learning media using Morph Animation developed in this study had a validity level of 3.6 (Very Valid), a practicality level based on student responses of 3.9 (Very Practical), and teacher responses of 3.8 (Very Practical). The students' learning achievement test using the PowerPoint (PPT)-based learning media with Morph Animation reached 88.8% (Very Effective). This indicates that the developed media meets the criteria for being suitable for use in the learning process, as it fulfills the valid, practical, and effective criteria. As a result of this research, the developed instructional media is expected to motivate students to learn independently and assist teachers in delivering the material more effectively.

Keywords: *Learning Media, Morph Animation, PowerPoint (PPT), Circulatory System.*

1) INTRODUCTION

Education is a human activity aimed at developing one's personality through internal and physical potentials, spiritual aspects such as thinking, will, emotion, creativity, and morality, as well as physical aspects including sensory abilities and skills. The primary goal of education is to cultivate fundamental intellectual and emotional capacities. Indirectly, education also supports children's development toward maturity (Wahyuminati, 2023). In general, education serves as an effort to equip learners through teaching, training, and guidance so that they are able to compete in the future (Agustiana, Putra, & Farida, 2018).

Education and learning are two distinct yet closely related concepts. Learning refers to a series of activities conducted by educators to guide, teach, and direct students in the learning process (Hakim

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

& Windayana, 2016). It is a component of the broader educational process that involves reciprocal interaction between learners and educators utilizing learning media. Learning media play a crucial role in fostering students' motivation, as they allow learning materials to be presented in varied and non-monotonous ways, thereby increasing students' enthusiasm during the learning process (Setyawan & Dodiet, 2012).

The delivery of learning materials requires a medium that ensures appropriate and effective transfer of knowledge. This medium refers to learning tools that support students' success (Hamid, 2020). A wide range of media can support learning, including digital devices and computer software. Traditional presentations are often limited in their ability to display dynamic content. As an alternative, educational animation may be employed, which refers to the use of animated displays to present learning materials and support teaching and learning activities (Hidayatullah, 2014).

The main function of learning media is to assist educators in communicating messages and materials to learners so that the content can be easily understood and stimulate students' cognitive development (Indriyani, 2019). One such medium is PowerPoint, a presentation software application included in the Microsoft Office suite (Muthoharoh, 2019). PowerPoint presentations organize and display information in a series of slides, enabling the audience to more easily comprehend explanations through visual elements such as text, illustrations, diagrams, audio, video, and other components (Purnomo, 2009).

Based on observations conducted at SMAN 10 Bulukumba, both teachers and students experience several challenges in biology lessons, particularly in the topic of the circulatory system. The learning media commonly used such as textbooks, worksheets, and posters are limited in their ability to present animations that help clarify key concepts. Teachers also frequently use PowerPoint as a learning medium, however, its use has not been sufficient to support students in fully understanding the material being taught. This is because the PowerPoint presentations employed in the learning process are still conventional, consisting predominantly of text with minimal visual examples or animations. Such limitations make it difficult for students to comprehend the material, particularly in topics such as the circulatory system. One of the factors contributing to the difficulty of understanding circulatory system material is the complexity of the explanations, which require supportive animations to help students grasp the material more effectively. Therefore, the development of PowerPoint media incorporating Morph Animation can provide more comprehensive content enriched with clear

animations and supporting videos. Such media can facilitate both learners and teachers in mastering the concepts of the circulatory system more thoroughly.

2) METHODS

This research is a type of research and development study, commonly referred to as Research and Development (R&D), employing the ADDIE development model, which consists of five procedural steps: Analyze, Design, Development, Implementation, and Evaluation. This model aims to produce an educational product and examine the effectiveness of the developed outcome (Mustami, 2015). The ADDIE model was selected because it facilitates evaluation and revision at each stage, allowing the resulting product to become more practical, valid, and effective. Evaluation is conducted through questionnaires or interviews throughout the process. Each step is continually refined based on the evaluation results from the preceding stage, ensuring the production of a valid final product. Prior to the trial phase, the learning media was revised according to the assessments, comments, and suggestions provided by experts. The ADDIE model consists of five main stages: analysis, design, development, implementation, and evaluation (Noviyanti & Gamaputra, 2020). The product developed in this study is a PowerPoint learning media integrated with Morph Animation for the circulatory system topic for Grade XI students at SMAN 10 Bulukumba. The ADDIE instructional design model is one of the frameworks widely implemented in educational research and development (Spatioti et al., 2022).

The subjects of this study were students of class XI.7 at SMAN 10 Bulukumba. The development of the PowerPoint learning media based on Morph Animation was tested on 36 Grade XI students. Prior to classroom implementation, the product underwent expert validation to ensure its validity before being used in an actual learning setting (Kurniawan, 2018).

The instruments used in this study included validation sheets, teacher and student response questionnaires, and learning achievement tests. Data obtained from the validators' assessments were analyzed descriptively. For example, the validity analysis employed Formula 1 proposed by Ridwan (2003):

$$K_i = \frac{\sum_{j=1}^n n \cdot 1V_{ij}}{n} \dots$$

Description:

K_i = Average score for the i-th criterion

V_{ij} = Evaluation score for the i-th criterion for the j-th validator

n = Number of validators

Next, the validity criteria for each category were determined by comparing the mean score of each category, aspect, and overall score with predetermined validity criteria. The validity criteria are presented in Table 1.

Table 1: *Validity analysis*

Score Interval	Criteria
$v \leq 3,5$	Very Valid
$2,9 \leq v < 3,4$	Valid
$2,3 \leq v < 2,8$	Fairly Valid
$1,7 \leq v < 2,2$	Less Valid
$v \leq 1,6$	Not Valid

(Hartanto, 2020).

The practicality criteria were analyzed based on teacher and student response questionnaire data. These data were calculated using Formula 1, and the mean scores were classified according to the practicality criteria in Table 2.

Table 2: *Practicality Analysis*

Score Range	Criteria
3,26 - 4,00	Very High
2,51 – 3,25	High
1,76 – 2,50	Low
1,00 – 1,75	Very Low

(Ulfa dkk, 2022).

Students' learning achievement was calculated using Formula 2 from Rosna (2014). The effectiveness of learning outcomes, once calculated, was categorized according to Table 3.

$$N = \frac{B}{n} \times 100\%$$

Description:

N = Student's Score

B = Number of correct answers

n = Total number of items

Table 3: *Effectiveness Analysis*

Percentage (%)	Criteria
90-100	Very Effective
75-90	Effective
60-75	Fairly Effective
40-60	Less Effective
0-40	Not Effective

(Hobri, 2020).

3) RESULTS AND DISCUSSION

The development of the PowerPoint learning media based on Morph Animation employed the ADDIE model, which consists of five stages. The ADDIE model is a structured development framework systematically designed to address instructional problems by aligning learning resources with student characteristics. It is widely used in the development of multimedia for teaching and learning because of its iterative and cyclical nature, which allows for evaluation at each phase before proceeding to the next step (Hanafi et al., 2020).

The first stage is the analysis stage (Analyze). In this phase, the researcher validates the learning problems by conducting interviews with teachers and students to identify existing challenges or

obstacles. Learner analysis is then carried out to determine how students respond to and process information during learning activities, serving as a foundation for developing the PowerPoint learning media. Next, the learning objectives are analyzed to determine the intended outcomes of the instructional sequence. These objectives must include four essential components: Audience, Behavior, Condition, and Degree. This stage involves observations and interviews with both teachers and students.

The analysis phase consists of several steps. The first is the needs analysis, which aims to identify barriers encountered in the learning process and formulate solutions. The second step involves analyzing the learners to obtain an overview of their characteristics during instruction. The third and final step focuses on content analysis, which includes determining the material to be incorporated into the learning media. In this study, the researcher selected the circulatory system topic, covering subtopics such as functions, components, and disorders of the circulatory system. This topic is considered difficult by many students due to its complex mechanisms, which require extensive illustrations to clarify the content; therefore, the developed media must align with these material characteristics.

The results of the analysis phase then serve as a foundation for subsequent development steps. The final step in the analysis stage is identifying development needs to ensure that the chosen material aligns with the product to be developed. The material selected for this study is the human circulatory system because it contains numerous theoretical concepts and unfamiliar terminology. Furthermore, students' limited imagination creates additional barriers in absorbing and understanding the material. Thus, the development of PowerPoint media using Morph Animation is intended to support students' comprehension by integrating various media elements such as text, images, videos, and other visual components.

The second stage is the design phase, which involves creating an initial prototype of the media based on the results of the previous analysis. This stage includes selecting the appropriate type of media according to the obstacles or issues identified earlier, followed by determining the media format to ensure that learners receive the visual learning support they need. The activities in this phase consist of developing a preliminary media design (prototype), selecting a color palette, arranging the layout, The first stage is the analysis stage (Analyze). In this phase, the researcher validates the learning problems by conducting interviews with teachers and students to identify existing challenges or

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The third stage is the development phase, which involves transforming the prototype into a functional and usable final version of the media. In this stage, the researcher revises and refines the product based on feedback (suggestions and recommendations) provided by the team of validators. In this study, the media underwent two to three rounds of revision until it was approved by the validators and deemed ready for implementation. The final outcome of this phase is a validated PowerPoint learning media product based on Morph Animation.

The fourth stage is the implementation phase, during which the learning media is applied in a real classroom setting. This stage involves two main activities. The first is administering response questionnaires to measure the level of practicality of the media. The second is administering an academic achievement test to determine the effectiveness of the developed product. The fifth stage is the evaluation phase, which consists of analyzing the collected data as well as assessing the strengths and weaknesses of the developed media after it has undergone implementation.

Based on the preceding description, it can be concluded that the development process of the PowerPoint-based learning media utilizing Morph Animation has fulfilled the criteria of being valid, practical, and effective. This Morph Animation based PowerPoint media is expected to enhance the quality of pedagogical interactions between educators and learners within the classroom environment. The use of PowerPoint as a learning medium enables instructional content to be presented in a more attractive manner with clearly defined learning targets when delivered. Furthermore, it supports the integration of various media elements, such as text, images, audio, video, and animation, thereby increasing both its aesthetic and didactic value as an engaging learning resource (Anyan, 2020).

Validity Level of Morph Animation Based PowerPoint Learning Media

The Morph-Animation-based PowerPoint learning media was developed with the aim of assisting both students and teachers in accessing additional learning resources and supporting comprehension of the instructional content. Before being utilized in classroom learning, the media must undergo several stages, beginning with the validation phase using expert validation sheets to determine whether the product is feasible for instructional use.

The validity score was obtained at the development stage based on assessments from expert validators, as presented in Table 4. Based on the analysis using the media validity test conducted by the researcher, the Morph-Animation-based PowerPoint learning media obtained an overall mean score of 3.6, which falls into the “highly valid” category. Therefore, it is appropriate to conclude that

the media is suitable for use as a learning tool for the circulatory system topic. This finding is aligned with the theoretical guideline stating that if the average validity score exceeds 3.4 ($3.4 \leq v < 4$), the media is considered valid (Ridwan, 2003).

Table 4: *Results of Media Validity Analysis*

Assesment Aspects	Mean Score	Category
Display	3.8	Highly Valid
Content	3.7	Highly valid
Attractiveness	3.7	Highly Valid
Language	3.4	Valid
Ease of Use	4.7	Highly Valid
Overall Mean	3.6	Highly Valid

The display aspect achieved an average score of 3.8 (highly valid). The design of the PowerPoint media incorporates text, images, audio, and animated video elements aligned with the learning material, making it operable by teachers according to the instructional theme. Therefore, PowerPoint functions as an engaging learning medium (Herlina & Saputra, 2022).

The content aspect obtained an average score of 3.7 (highly valid). The circulatory system material, including its functions, components, and disorders. Presented in the PowerPoint media must be relevant to learning indicators and student needs. This indicates that the media meets validity criteria when it aligns with writing conventions, basic competencies, and has clear material organization presented coherently according to the topic (Leacock & Nesbit, 2007).

The assessment of the attractiveness aspect obtained an average score of 3.7, categorized as highly valid. PowerPoint learning media represents a form of digital instructional tool that emphasizes the visual delivery of information. In Morph Animation–based PowerPoint media, the use of animated elements becomes a crucial feature for enhancing both visual appeal and conceptual understanding. Animation is selected as an effective and engaging means of presenting instructional content (Ulfah, Setiawan & Anggraini, 2024). Moreover, the incorporation of various visual components, including images and animations successfully captures students’ attention, accommodates diverse learning styles, and increases learners’ motivation to engage with the material (Putri et al., 2024).

The language aspect received an average score of 3.4 (valid). Proper and accurate language use must follow established conventions, including adherence to the Indonesian Spelling System (PUEBI) (Ruslana, 2022).

The ease-of-use aspect achieved an average score of 3.7 (highly valid). Learning media are considered feasible and valid when receiving a minimum rating of “good” (Pradana et al., 2021). The Morph-Animation-based PowerPoint media meets several indicators of validity, including an engaging design, clear and comprehensible language, absence of ambiguous meanings, and content presentation aligned with learning indicators and basic competencies (Leacock & Nesbit, 2007).

Practicality Level of the Morph-Animation-Based PowerPoint Learning Media

The practicality level was tested during the implementation phase by distributing response questionnaires to teachers and students after using the media in the classroom. Based on the practicality test covering presentation techniques, language appropriateness, content accuracy, media–material alignment, and usability. The results in Table 5 show that the teacher response earned a mean score of 3.8 (highly practical), while the student response achieved 3.9 (highly practical). Thus, the Morph-Animation-based PowerPoint learning media is considered practical for classroom use. This is supported by Nurdin (2007), stating that when the mean practicality score exceeds 3.5 ($3.5 \leq v \leq 4$), the media falls within the “highly practical” category.

Table 5: *Practicality Analysis Results*

No	Assesment Type	Mean Score	Category
1	Teacher Response	3.8	Highly Practical
2	Student Response	3.9	Highly Practical

This finding aligns with Paramita and Agustini (2016), who assert that learning media can be considered practical when it receives positive responses from both teachers and students. Nieveen (in Irawan & Hakim, 2021) further explains that learning media are practical when they are easy to use, easy to understand, and consistent with the planned design. Practical learning media should facilitate information delivery, enhance understanding, and guide students toward optimal learning outcomes. The practicality level can be measured during the implementation stage through teacher and student response questionnaires.

Effectiveness Level of the Morph Animation Based PowerPoint Learning Media

The media's effectiveness was evaluated during the implementation phase through a post-learning achievement test. Effectiveness was determined based on improvements in students' learning outcomes, reflecting their level of comprehension of the circulatory system material after using the developed media. The test consisted of 27 multiple-choice questions, administered to 36 Grade XI students from class XI.7 of SMAN 10 Bulukumba.

Table 6: *Effectiveness Analysis Results*

Score Range	Assesment Category	Number Of Student	Percentage
75-100	Mastery Achieved	32	88.8%
0-75	Mastery Not Achieved	4	11.2%
Total		36	100%

Based on the analysis, 32 out of 36 students (88.8%) achieved the minimum mastery criterion, while 4 students did not meet the Minimum Mastery Criterion (KKM). According to Nur and Masita (2022), learning media are considered effective when student mastery levels exceed 74% (75%-90%). These findings are consistent with Haviz (2013), who notes that an effective educational product aligns with its intended objectives, as evidenced by learning outcome data.

Effective learning media should assist students in achieving instructional goals optimally through meaningful learning experiences (Damopolii, 2019). Jelita (2010) states that Microsoft PowerPoint is a software tool that supports the development of effective, professional, and user-friendly presentation materials. Its ability to structure ideas clearly and attractively enhances the quality of instructional delivery.

PowerPoint offers several advantages, including practicality for various classroom sizes, enabling real-time interaction and observation of student responses, and providing diverse presentation techniques that reduce monotony. The integration of clipart, images, colors, animations, and audio elements increases student engagement (Kamil, 2018). Additionally, PowerPoint effectively supports topics such as the circulatory system, which are abstract and often difficult for students to visualize. The transitions, animations, hyperlink features, learning videos, and quick-access tools further enhance learner comprehension. However, despite these strengths, PowerPoint remains primarily a visual medium and lacks interactive multimedia features such as built-in quizzes. The incorporation of AI-based movement algorithms in PowerPoint's Morph transition also limits manual control over certain animation trajectories.

4) CONCLUSIONS

The use of PowerPoint media can support both teachers and learners, as it enhances engagement in biology learning, which is typically delivered through conventional methods. PowerPoint media enables the integration of text, images, audio, video, and animations, thereby creating an attractive instructional environment. PowerPoint is also a software designed to present engaging multimedia content that is easy to design and operate. The Morph Animation–based PowerPoint media is deemed valid because it fulfills several criteria, including a unique and appealing design, the use of clear and comprehensible language, the absence of ambiguous meanings, and the presentation of instructional content aligned with learning indicators and basic competencies. The media is categorized as highly practical, as evidenced by positive responses from both teachers' and students' questionnaires. Furthermore, the Morph Animation–based PowerPoint media has been proven effective in supporting students' achievement of learning goals. This effectiveness is reflected in the number of students who successfully achieved scores above the Minimum Mastery Criterion (KKM), totaling 32 learners.

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