



Development of Learning Media for Biolarga (Biology of Snakes and Ladders) Containing Critical thinking Skills in Class IX Human Reproductive System Material

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Article Information	ABSTRAK
Submitted: 02 – 03 – 2024 Received: 30 – 08 – 2024 Published: 30 – 09 – 2024	<p>Penelitian ini bertujuan untuk menganalisis karakteristik dan kelayakan pengembangan media pembelajaran biolarga (biologi ular tangga) bermuatan critical thinking skills pada materi sistem reproduksi manusia. Pengembangan dilakukan menggunakan model pengembangan 4D (Define, Design, Develop, dan Disseminate). Media pembelajaran dikembangkan dan diuji cobakan pada siswa kelas IX MTs N 3 Grobogan. Instrumen pengumpulan data menggunakan lembar validasi untuk mengetahui kelayakan produk melalui validator ahli media, ahli bahasa, ahli materi, ahli berpikir kritis dan ahli praktisi. Berdasarkan hasil validasi dan uji coba pada siswa, diperoleh rata-rata persentase kelayakan yakni 84.28%. Hasil penelitian tersebut menunjukkan bahwa media pembelajaran yang dikembangkan layak digunakan sebagai media untuk menunjang proses pembelajaran khususnya pada materi sistem reproduksi manusia.</p> <p>Kata kunci: Kemampuan Berpikir Kritis, Sistem Reproduksi Manusia, Media Pembelajaran, Ular Tangga Biologi.</p>
Publisher	ABSTRACT
Departement of Biology Education, Faculty of Science and Technology, UIN Walisongo Semarang	<p><i>This research aims to analyze the characteristics and feasibility of developing biolarga (biology of snakes and ladders) learning media containing critical thinking skills on human reproductive system material. Development is carried out using a 4D development model (Define, Design, Develop, Disseminate). Learning media was developed and tested on class IX students of MTs N 3 Grobogan. The data collection instrument uses a validation sheet to determine product suitability through validators, media experts, language experts, material experts, critical thinking experts, and practitioner experts. Based on the result of validation and trials on students, the average percentage of eligibility was 84.28%. The result of this research indicate that the learning media developed is suitable for use as a medium to support the learning process, especially regarding the human reproductive system.</i></p> <p>Keywords: Criical Thinking Skills, Human Reproductive System, Learning Media Developoment, Snakes and Ladders Biology.</p>

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INTRODUCTION

Education is an important component in the development of human resources, both moral, spiritual and social (Wati, 2021). Educators must design a good and correct learning process to achieve these goals (Afandi, 2015). According to Anggis (2022) the learning process is the interaction of various learning components so that previously planned goals are achieved. In Ministry of Education and Culture regulation no. 16 of 2022 concerning Educational Process Standards Article 12 states that the implementation of learning is actually held in a pleasant atmosphere so that students experience the learning process as an experience that gives rise to positive emotions in the form of feelings of joy, safety and interest, as well as being free from bullying.

The skill demands at 21 are critical thinking skills. Facion (Filsame, 2008) states that there are four indicators of critical thinking skills, namely interpretation, evaluation, analysis, and inferention. Critical thinking skills are important for students to have, because they help them think rationally in solving problems (Karim, 2015). Critical thinking skills also really help students to be able to adapt to the many innovations and new information (Bahari, 2021). Apart from that, critical thinking skills have a significant role in the learning process, especially science learning because critical thinking skills are one part of higher level thinking (Norrizqa, 2021). Based on data from the 2018 Programe for International Student Assessment (PISA), it is stated that the thinking skills of students in Indonesia are relatively low because they can only reach level 1 and level 2 of 6 levels of questions. This indicates that Indonesia is a low performance with high equity quadrant country.

In order to develop students' critical thinking skills, a good and structured learning scheme or mechanism is certainly needed. One thing that can support this is the use of learning media (Miftah, 2013). Learning media is a tool that can help the teaching and learning process so that the meaning of the message conveyed becomes clearer and educational or learning objectives can be achieved effectively and efficiently (Norrizqa, 2021).

Teacher are encouraged to use learning media when teaching because it can help educators in conveying material (Miftah, 2013). The earning media used are tools used to convey information (Dewi, Kurnia, dan Panjaitan, 2017). As in the hadits from Anas bin Malik RA narrated by Muttafaq 'alaih:

يَسِّرُوا وَلَا تَعْسِرُوا، وَبَشِّرُوا وَلَا تَنْفَرُوا

Meaning: "Make life easy, don't make it difficult, and give joy to joy, don't be afraid". (HR Imam Al-Bukhari no.69 and Muslim no.1734).

The above hadith not only has the context of theological preaching, but also suggests that when teaching something to other people, it should be something good and encouraging. Just like an educator who is teaching to students, the learning process must provide an atmosphere that is encouraging, fun and impressive. Because, fun and impressive learning can attract students' interest and motivation to

be actively involved, so that learning objectives can be achieved optimally (Ismail SM, 2010).

In science learning there is a lot of complex material, one of which is the Human Reproductive System (Kurniawati et al, 2020). The Human Reproductive System is class IX material. This material is quite complicated material to study because this material discusses the reproductive system in humans, such as mechanisms, organs and their functions, hormones, disorders, and so on. Moreover, this material is often considered taboo, so learning media is needed that can provide encouragement to students so that students can actively participate in critical thinking in carrying out all learning process activities (Aghni, 2018).

Based on the results of observations and interviews by researchers at MTsN 3 Grobogan regarding the science learning process, especially biology material on May 2023, it shows that the learning process implemented has not been effective, communicative and enjoyable. So, learning media is needed that functions as a facilitator of the learning process (Tafonao, 2018). Researchers distributed questionnaires to students to find out what type of media they liked and to find out more about students' characteristics. Based on the questionnaire, 72% of the 25 MTsN 3 Grobogan students stated that they liked learning media in the form of games.

Game learning media is designed to support the learning aspects (growth and development) of children and increase students' creativity (Solekhah, 2019). Game learning media can create a pleasant learning atmosphere. When students enjoy learning, it can trigger feelings of great curiosity, thereby leading students to think critically about the subject matter (Solekhah, Khasanah, dan Hariz, 2020). This is also reinforced by student questionnaire data which states that the percentage of students' critical thinking skills is 40.8% with details of 15 students being classified as less critical and 10 students being classified as quite critical.

METHODS

This research uses development research (R&D) with the 4D development model. The 4D development model consists of four stages, namely define, design, develop, and disseminate (Thiagarajan, 1974). However, this research has reached the 3D stage because further research is needed continuously and over a long period of time in order to reach the disseminate stage. According to Sugiono (2018), R&D research is research that produces certain products and is useful for testing feasibility and effectiveness by analyzing various potentials and challenges that exist in the field. Validation test and feasibility test data were analyzed using descriptive statistics referring to the criteria shown in Table 1.

Table 1. Eligibility Criteria

No	Percentage (%)	Criteria	Information
1.	82-100	Vey Worthy	Can be used without revision
2.	63-81	Worthy	Can be used with minor revision
3.	45-62	Not Worthy	Can be used with many revision
4.	25-44	Not Feasible	Not yet usable

After finding problems after observations, questionnaires, interviews and tests on students with the results above, it can be concluded that there is a need to develop game learning media that can train students' critical thinking skills. One of the game media that can be used as a tool to help the learning process is snakes and ladders (Ayu et al. 2022). Compared to other learning media, snakes and ladders media according to Ratnaningsih (2014) stimulate the development of thinking power, creativity and language in order to foster good mental and behavior, create an interesting, comfortable and enjoyable learning environment, provide scientific insight to students. Students go through a learning process while playing and practicing cooperation with fellow students.

Based on the explanation above, researchers conducted research aimed at analyzing the characteristics and feasibility of learning media products developed with the title: "Development of Biolarga (Biology of Snakes and Ladders) Learning Media Containing Critical Thinking Skills in Class IX Human Reproductive System Material."

RESULTS AND DISCUSSIONS

1. Characteristics of Biolarga Learning Media

The results of the development in the form of biolarga learning media (biology of snakes and ladders) containing critical thinking skills regarding the human reproductive system can be seen in Figure 1, which is composed of the following components:

a. Biolarga Game Board

The biolarga learning media board is designed with a size of 2x2.5 m. There is a different color in each box. The colors indicate the indicator categories for critical thinking skills, namely: interpretation (pink), analysis (yellow), evaluation (blue), and inference (green). On some of the boxes there are pictures of the human reproductive system, snakes & ladders icons, bomb icons, crown signs as symbols of special cards, and crosses & ticks as symbols of true and false cards.

b. Question Cards and Keys

The question cards contain questions that must be answered by students when using biolarga learning media. Meanwhile, the key cards are the answers to the question cards. There are 20 question cards and key cards with a size of 4x8 cm.

c. Special Card

This card contains several commands as ice breakers in learning so that there is a little pause and variation in playing the biolarga. There are 5 cards in total. The commands are: move back two squares, move forward three squares, swap positions, roll the dice again, and blacklist once.

d. True-False Cards

This card contains material about the human reproductive system, but is packaged with the choice of answering right or wrong. There are 6 cards in total.

e. Pocket Book

The pocket book is used as a reference for each group or team before starting the fiddle game. This book contains game instructions, descriptions and image markings in snakes and ladders, assessment instructions, and assessment sheets, as well as developer biographies. Pocket book measuring 10x15 cm.



Picture 1. Biolarga Learning Media



Picture 2. Question Card



Picture 3. Special Card



Picture 4. True-False Card



Picture 5. Pocket Book

2. Feasibility of Biolarga Learning Media

Biolarga learning media contains critical thinking skills, class IX human reproductive system material that researchers have developed which has been declared suitable for use in the learning process based on validation results from several validators, namely, media experts, material experts, language experts, critical thinking experts and practitioner experts (class teachers). IX) and the results of trials on students obtained results which can be seen in Table 2.

Table 2. Validation and Trial Result of Biolarga Learning Media

No	Validator	Average (%)	Criteria
1.	Media Expert	81	Worthy
2.	Material Expert	80	Worthy
3.	Language Expert	80	Worthy
4.	Critical Thinking Expert	80	Worthy
5.	Expert Practitioner	94,5	Very Worthy
6.	Student Trials	90,2	Very Worthy
Total		84,28	Very Worthy

The Biolarga learning media that the researcher developed has the characteristics of a biolarga learning media board, question, and key cards, special cards, true-false cards, and a pocket book. Previous research from Inka (2021), developed an HVS paper sized board and different games for each group. Meanwhile, researchers developed a large board with the aim of focusing on one game, thereby creating a student learning center. Apart from that, researchers also added variety to learning media by adding pocket books, special cards, and true-false cards.

Based on Table 2 above, it indicates that the biolarga learning media (biology of snakes and ladders) contains critical thinking skills in class IX human reproductive system material, with an average percentage of feasibility of 84.28%. This shows that the biolarga learning media that has been developed by researchers has obtained valid results and is suitable for use as learning media. According to Semadiartha (2012), learning media is said to be valid if it meets the requirements. First, in general the validator will state "good" or "very good" for the learning media components and in accordance with the learning indicators. A research by Solekhah (2020) and Bahari (2021) shows that learning media in the form of snakes and ladders is effective in the learning process and can improve student's critical thinking.

The biolarga learning media containing critical thinking skills that researchers have developed received a good response from class teachers and students when testing the game. The class teacher stated that the learning media was suitable for application at the school. The students also looked enthusiastic and were actively involved in taking part in the game. This is because the biolarga game is simple and enjoyable, so it can encourage students to enjoy learning more and restore the essence of students to always think critically by answering questions in learning media (Solekhah, Khasanah, dan Hariz 2020).

The biolarga game learning media can eliminate boredom among students, especially when it is nearing the end of the lesson (Nadiyah, 2022). According to

Kusuma et al (2020) media in the form of a game of snakes and ladders has also been proven to be more interesting for students in learning. One of the benefits of the snakes and ladders learning media is that it develops the affective and psychomotor aspects of students in addition to developing the cognitive aspects (Inka, 2021).

CONCLUSION AND RECOMENDATION

The Biolarga learning media that the researcher developed has the characteristics of a biolarga learning media board, question, and key cards, special cards, true-false cards, and a pocket book. The development of learning media for the biolarga game (biology of snakes and ladders) containing critical thinking skills in class IX human reproductive system material has been proven suitable for use as a learning medium. This is based on the assessment that media experts get a percentage result of 81%, material experts get a percentage result of 80%, language experts get a percentage result of 80%, critical thinking experts get a percentage result of 80%, while practitioner experts get a percentage result of 94.5%, as well as results Trials of learning media on students obtained a percentage result of 90.2%. So, the average percentage of feasibility results from validation and trials of learning media for the biolarga game (biology of snakes and ladders) containing critical thinking skills in the human reproductive system material is 84.28%.

Researchers certainly have limitations in conducting this research which may have an impact on the research results. These limitations include: limited research time, energy and researcher abilities; research is only limited to developing learning media and implementing it within a narrow scope, so it needs further development to make it more diverse and comprehensive. Suggestion for further research are that biolarga learning media can be developed in addition to containing critical thinking skills and also with other materials.

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