Development of Wick Editor-Based Learning Media that Emphasizes the Creative Thinking Ability

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Hendarto Cahyono hendarto@umm.ac.id	This development research aims to (1) Know the practicality of learning media based on the wick editor to be used in the learning process on the material of arithmetic rows and series (2) Know the response of students to the use of learning media in the classroom; and (3) Improve students' creative thinking skills to solve problems related to mathematics This research is a Research and Development (R&D) study with the ADDIE development model, namely Analysis, Design, Development, Implementation, and Evaluation. Data collection techniques used interviews, validation, student response questionnaires, and student creative thinking ability questionnaires. Validation was carried out by academics and practitioners, as well as students' responses. The wick editor-based learning media developed was tested on 34 students of class VIII at senior high school. The results of material expert validation obtained an average score of 82.95% with very valid criteria. The practicality of the media obtained from the student response questionnaire obtained an average score of 90% with very practical criteria. The effectiveness of the media is obtained from the average results of the questionnaire of students' thinking skills with an average N-Gain score of 0.75 with a high category.

INTRODUCTION

Teacher is an educator who is expected to create a good learning situation in the classroom. Learning has the meaning of a process of changing behavior that is raised due to external stimuli. According to Rejeki (2020), the learning process involves various elements, namely the physical and psychological conditions of people who can affect learning outcomes, coupled with the support of a good atmosphere while learning, the availability of adequate learning media, and others. Therefore, these elements need to be considered so that learning objectives can be achieved.

One of the efforts to achieve learning objectives is by delivering subject matter through the teacher. The delivery of material is usually done by the lecture method, where this lecture method has disadvantages. According to Abuddin Nata in Wirabumi (2020), there are weaknesses in the lecture teaching method, namely that it tends to make students less creative, the material presented is only based on

the teacher's memory, the ability of students not to absorb the material as a whole, and experience difficulties in learning. In addition, the lecture method is identical to everything that is verbalistic so that the teaching and learning process in class is monotonous. Only the teacher speaks, while students dominantly note, remember, and record what is remembered throughout the assignment. (Wahyu et al., 2020).

In reducing the monotony of the teaching and learning process in class, the use of learning media is one option in presenting subject matter so that the material presented looks more interesting than just using explanations on the blackboard. According to Nurrita (2018), learning media is a learning resource that can help teachers enrich knowledge, with various types of learning materials owned by teachers, can help instill knowledge to students. The utilization of learning media is expected to make it easier for students to understand the subject matter being taught (Rohani, 2019).

In addition, the existence of learning media that functions as a tool in presenting subject matter is also expected to improve students' creative thinking skills. According to Dewi and Masrukan (2018) in Mahfi (2020), creative thinking is an activity carried out by someone in solving a mathematical problem in a variety of ways. Creative thinking is a habit of thinking that is learned by paying attention to different points of view, which helps students to have imagination, to show new possibilities, to open themselves to different points of view and to come up with unusual ideas. Creative thinking ability is one of the important factors in solving various problems, especially mathematics. However, the low mathematical creative thinking ability of students is another problem that is currently being experienced (Priangga, 2021). In addition, the problem of students' low creative thinking skills in schools tends to be caused by the lack of teaching variations by teachers (Sanusi et al., 2020). Therefore, the use of learning media can improve creative thinking skills and help teachers overcome various learning problems of students in learning mathematics.

Learning media is proven to have an impact in the form of increasing students' creative thinking skills. Previous research on the development of learning media on creative thinking skills by Heswari (2022), proves that the development of learning media can show effectiveness in improving creative thinking skills. In addition, previous research by Sanusi (2020), states that by utilizing learning media, creative thinking skills in mathematics lessons increase and can help teachers in overcoming difficulties experienced by students. There are differences between previous research and this study, namely the tools used in developing learning media and the material displayed on learning media.

The learning media that will be developed by researchers is the wick editor website. Wick editor is a website that is not only used to create animated videos but can also be used to create learning media, games, and others. In addition, the wick editor also has advantages where the wick editor does not have a special storage space and has a complete editing menu. The learning media developed in the wick editor is expected to help students in developing creative thinking skills, especially in learning mathematics. Math is often considered a lesson that seems difficult and scary (Dwiranata et al., 2019). If a subject, especially mathematics, is presented by

utilizing learning media, it can help students in solving problems (Maharani et al., 2018). In addition, Miftah (2013) states that the provision of adequate learning media is expected to provide important meaning in improving the learning process because the utilization of learning media is expected to accelerate the distribution and dissemination of learning quality.

The material that will be displayed with Wick Editor-based learning media is arithmetic rows and series. According to Miftahul Reski Putra Nasjum (2020), arithmetic ranks and series is one of the materials that can train students in mathematical problem solving skills. The material of arithmetic sequence and sequence is one of the materials that VIII students learn. Arithmetic sequence is a sequence of numbers that has a certain pattern in the form of addition and has the same difference, while arithmetic sequence is the sum of the terms in the arithmetic sequence (Kemendikbud, n.d.). The material of rows and series is very important material to be learned by students because it is very useful when students enter the world of work (Alpiani et al., 2022). In addition, Alpiani et al. (2022) mentioned that there are some student difficulties with the material of rows and series, namely in determining the formula for the nth term of arithmetic and geometric rows, understanding the concept of the first term and understanding the problems of rows and series. In an effort to overcome these problems, the researchers are interested in making this material to be displayed in Wick Editor-based learning media.

Based on the aforementioned background, the study aims to assess the effectiveness of learning media in teaching arithmetic and sequence topics, evaluate student reactions to the use of such media in classrooms, and enhance students' problem-solving skills in mathematics. The research on Wick Editor-based learning media development offers several benefits. Researchers can use it as a reference for future studies on learning media development, particularly those based on Wick Editor. Teachers can benefit from the created media by introducing a fresh approach to teaching. Students, on the other hand, are expected to find the developed learning media helpful in better understanding lessons and enhancing their creative thinking skills.

RESEARCH METHOD

In this study, the Research and Development (R&D) method was used. As explained by Haryati (2019), Research and development is different from conventional research which only provides suggestions for improvement, research and development can produce products that can be used directly. The procedure in this study uses the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model approach. The ADDIE model concept is applied to build basic performance in learning, especially the concept of developing learning product designs (Hidayat & Nizar, 2021). The subjects of this research were VIII grade students of SMPN 1 Kencong which was carried out in the odd semester of the 2023/2024 academic year. In this study, the products were developed to determine validity, practicality, and effectiveness. The data collection instrument consists of an interview guideline sheet for teachers, a media practicality assessment sheet by lecturers and teachers, a media practicality assessment sheet by students, a questionnaire sheet for students' creative thinking skills.

Figure 1. The Development model of ADDIE

Data collection techniques that will be carried out in this study include interviews, expert validation, student response questionnaires, and student creative thinking ability questionnaires. The interview process was conducted by direct face-to-face. The interview method was conducted to junior high school mathematics teachers to obtain information and identify problems to investigate and provide analytical data needed to determine the learning support model to be developed. Furthermore, the validation process is given to academics and practitioners to test the validity of learning media before being tested on students. After validation, the *wick editor-based* learning media will be displayed to students. The learning media displayed requires student responses to find out whether the learning media can be said to be practical in the learning process. The media can be said to be practical if it meets the predetermined criteria. The last data collection technique is a questionnaire of students' creative thinking skills. The use of this creative thinking ability questionnaire serves to determine the effectiveness of wick editor-based learning media. The effectiveness of the media is seen from the increase in the creative thinking ability of students after the use of wick *editor-based* learning media by paying attention to the N-Gain value.

Table 1. Assessment score of wick editor learning media

Description	Score
(SS) Very suitable	4
(S) Appropriate	3
(TS) Not suitable	2
(STS) Strongly Disagree	1

Source: (Sulistyaningrum, 2017)

Table 2: Criteria for validation

Validity Criteria	Validity Level
81% ≤ V ≤ 100%	Very Valid, or can be used without revision
61% ≤ V ≤ 80%	Valid, or can be used but minor improvements are needed
41% ≤ V ≤ 60 %	Less Valid, recommended not to be used as it needs major
21% ≤ V ≤ 40%	Invalid, or should not be used
0% ≤ V ≤ 20%	Strongly invalid, or cannot be used

Source: (Sulistyaningrum, 2017)

Table 3. Learner Response Questionnaire Criteria

Description	Score
(SB) Very Good	4
(B) Good	3
(K) Less	2
(VK) Very Poor	1

Source: (Alpiani et al., 2022)

Table 4: Criteria for validation

Validity Criteria	Validity Level
$81\% \leq P \leq 100\%$	Very Practical
$61\% \leq P \leq 80\%$	Practical
$41\% \leq P \leq 60\%$	Practical Enough
$21\% \leq P \leq 40\%$	Not Practical
$0\% \leq P \leq 20\%$	Not Very Practical

Source: (Alpiani et al., 2022)

Table 5. Criteria for Creative Thinking Ability Questionnaire

Description	Score
(SB) Strongly Agree	4
(B) Agree	3
(K) Disagree	2
(VK) Very Disagree	1

Table 6. N-Gain value categories

N-gain value	Category		
N-gain > 0,7	High	High	High
$0,3 \leq$ N-gain $\leq 0,7$		Medium	
N-gain < 0,3		Low	

RESULTS AND DISCUSSION

The wick editor-based learning media development process uses the ADDIE development model, namely Analysis, Design, Development, Implementation, and Evaluation.

a. Analysis

At the analysis stage, researchers analyzed the use of learning media and students' creative thinking skills by conducting interviews with the math teacher and found problems that occur in class VIII students of SMPN 1 Kencong, namely: (1) The learning media used tends to be simple, (2) Difficulty creating learning media due to menu limitations, (3) Teachers often utilize the lecture method during the learning process; and (4) The low creative thinking ability of students in grade VIII SMPN 1 Kencong. The solution to these problems is to develop learning media with the wick editor website and it is hoped that the learning media can improve the

creative thinking skills of students, especially students of class VIII SMPN 1 Kencong.

b. Design

The next stage in this research is the design stage. In the design stage, researchers design learning media using the Wick Editor website on a laptop. In the Wick Editor-based learning media, researchers will design a material layer that includes the learning material that students will achieve according to the indicators of creative thinking skills. Wick Editor-based learning media consists of the Home Page, Material Page, and Quiz Page. The material page is designed by considering the indicators of creative thinking skills, namely fluency and flexibility. The fluency indicator is related to the ability of students to solve problems with various ideas so that the media is designed by considering several mathematical solutions displayed in the wick editor learning media. While the flexibility indicator relates to the ability of learners to think of ways to solve math problems, learning media displays several formulas or formulas before solving math problems. The Quiz page is designed by considering the indicators of elaboration and originality. The elaboration indicator relates to the ability of students to develop and enrich ideas or ideas in solving the given mathematical problems, and the media is designed by displaying games to be solved by students with various ideas that have been thought of. And the indicator of originality is related to the ability of students to solve mathematical problems related to ideas from within each of them.

c. Development

The development stage is the stage where learning media can be developed on the wick editor website. The wick editor media is developed into three parts, namely the home page, material page, and quiz page. Figure 2 show the Home Page of media. Figure 3 show the material page and Fifure 4 show the Quizz Page.
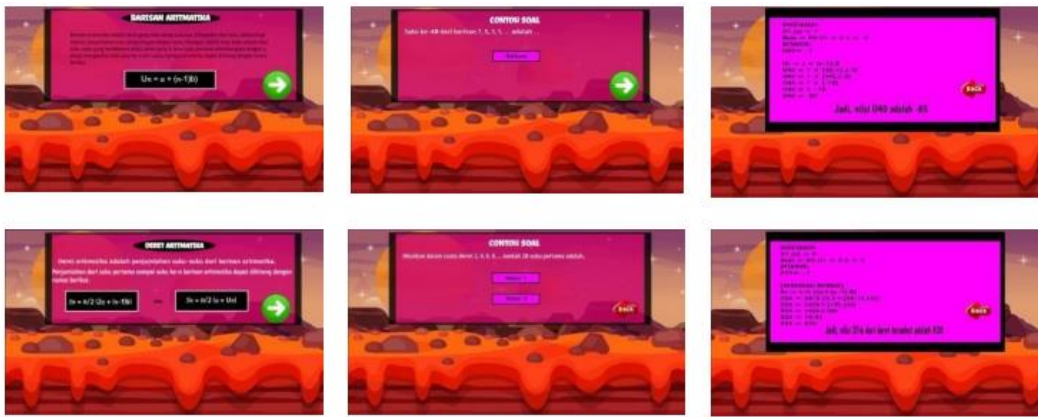

Figure 2. Home Page

Figure 3. Material Page

Figure 3. Quizz Page

After the media is developed with the *wick editor website*, an initial draft of learning media is obtained which will be tested on students. But before that, the media was validated by academics and practitioners, namely 1 lecturer in the

mathematics education study program at the University of Muhammadiyah Malang, and a teacher of mathematics class VIII SMPN 1 Kencong. This validation stage aims to determine the validity of the *wick editor* learning media and the feasibility of learning media that will be displayed to students. The results of the validator assessment can be seen in Table 1.

Table 7. Learning Media Validation Results

Aspect	Total value
Audio visual aspect	121
Content aspect	61
Other aspect	37
Total	219
Maximum score	264
Percentage	82,95%

In accordance with table 1, it can be seen that the validity of *Wick Editor-based* learning media by validators can be categorized as very valid with an average percentage of 82.95%. In addition, there are also suggestions from validators on the *wick editor* learning media*, the* following are the results of improvements that have been made based on suggestions from validators.

1. The addition of the instructions menu for using the *wick editor* learning media on the initial page of the learning media. The media display before and after the revision is in Figure 5 and 6.
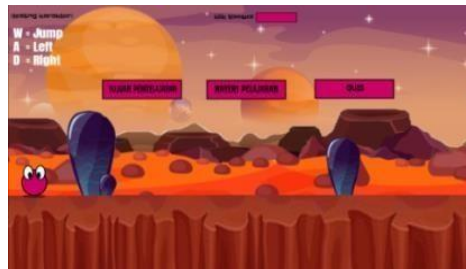

Figure 5. Menu display of instructions for use before revision

Figure 6. Menu display of instructions for use after revision

2. Reduction of the audio volume from 1 *wick editor* volume to 0.2 *wick editor* volume

d. Implementation

After the learning media is validated by academics and practitioners, the wick editor learning media is ready to be tested on students, namely at the implementation stage. This implementation stage also aims to determine the practicality and effectiveness of wick editor- based learning media. The practicality of the media can be seen from the ease of operation and make it easier for students to understand the materials that have been presented. To find out the practicality of this wick editor-based learning media, students are given a response questionnaire about the practicality of the media. The learning media practicality score can be seen in table 8.

Table 8. Results of the Learner Response Questionnaire

Aspect	Percentage Score
Media Display	91 %
Material	89 %
Benefits	89 %
Average	90 %

In accordance with table 2, it can be seen that the practicality of *Wick Editor-based* learning media by students can be categorized as very practical with an average percentage of 90%. The effectiveness of the media can be seen from the increase in students' creative thinking skills after the use of *wick editor-based* learning media in the learning process. This *wick editor*-based learning media was tested on 34 students of class VIII SMPN 1 Kencong. The increase in students' creative thinking ability was obtained by giving a creative thinking questionnaire before and after the use of wick *editor-based learning media in* the learning process. The score of the increase in creative thinking ability is obtained by equation (1).

$$N - Gain = \frac{Spost - Spre}{Smax - Spre} \quad (1)$$

Description: Spost = Final Test Average Score
Spre = Average Score of Initial Test
Smax = Maximum Score

Wick editor-based learning media is said to be effective if it has an effect or influence after use. So that in this study the effectiveness of the media is seen from the results of the questionnaire of creative thinking skills (before and after) students who have increased. The creative thinking ability questionnaire given to students before and after the learning process takes place. The results of the increase can be seen in the N-Gain table of the students' creative thinking ability questionnaire, namely in table 9.

Table 9. Results of Students' Creative Thinking Ability Questionnaire

Indicator	N-Gain	Category
Fluency	0,78	High
Flexibility	0,73	High
Elaboration	0,68	Medium
Originality	0,78	High

Average	0,75	High

The results of the students' ability questionnaire based on the results of the students' creative thinking ability questionnaire showed an average increase of 0.75. So that based on the N-Gain table, the creative thinking ability of students after using the wick editor learning media is in the high category. Therefore, it can be concluded that the wick editor learning media can improve students' creative thinking skills, especially in learning mathematics.

e. Evaluation

The results that have been carried out in the previous stages found that learning media are needed by students to improve their creative thinking skills, so the wick editor learning animation media was developed. However, there are still obstacles found, such as the wick editor learning media that can only be used on a PC or laptop. This is because the use of a large number of animations causes the media to have a large size as well, so it cannot be opened with a low-specification laptop.

This study creates educational materials for classroom learning. According to the analysis, teachers at SMPN 1 Kencong do not utilize learning materials, leading to low creative thinking skills in students. Previous research by Mahfi (2020) highlighted the lack of specific media to support students' creative thinking. Following the design phase, the development stage was initiated to realize the learning materials. This makes the materials suitable for teaching sequences and arithmetic series. Imroatun & Nia Sania Effendi's (2022) study supported the effectiveness of similar learning materials in aiding student understanding. Windarti (2021) also emphasized the importance of engaging learning materials for mathematical problem-solving. Subsequently, the materials were tested on students to assess their impact on the learning process. This implementation stage aimed to evaluate the practicality and effectiveness of the materials, with a 90.0% positive response rate from students, indicating high practicality based on Alpiani's (2022) criteria. Gulo & Harefa's (2022) research further supported the practicality of learning materials based on student feedback. Yani's (2022) study also highlighted the practicality of using learning materials post-reception, emphasizing their effectiveness in education.

From the explanation above, it can be concluded that mathematics learning media can enhance students' creative thinking abilities (Lailatul Auliah, Syaiful, 2020). In this context, Alpiani (2022) suggests that learning media created with creativity can assist teachers and students in addressing mathematical problems, particularly those related to lines and series. For example, the wick editor learning media has been proven to be valid, practical, and effective in enhancing students' creative thinking abilities.

CONCLUSION

The conclusion of this research is that the wick editor learning media developed is stated to be very practical, very valid, and effective in improving

students' creative thinking skills to be used in presenting arithmetic sequence and row material. The validity of the media is reviewed from the results of validation from experts with a percentage of 82.95%. Therefore, the learning media is categorized as valid and can be used in the learning process in the classroom.

Then, the wick editor learning media developed was also declared practical as evidenced by the results of the student response questionnaire which obtained a percentage of 90.0%. Therefore, based on the criteria table, the wick editor learning media is declared very practical for use in the learning process.

In addition, the wick editor learning media is also declared effective because it improves the creative thinking skills of students. This is evidenced by the results of the student response questionnaire from the indicators obtaining an average N-Gain value of 0.75 which consists of the N-Gain value of fluency with an N-Gain of 0.78, flexibility with an N-Gain of 0.73, originality with an N-Gain of 0.68, and the ability to elaborate with an N-Gain of 0.78. Therefore, it can be concluded that the Wick Editor-based learning media is valid, practical, and effective for use by students in the teaching and learning process, so that it can improve creative thinking skills in mathematics lessons and make it easier for teachers to provide lessons.

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