

## DEVELOPMENT OF INTERACTIVE LEARNING MEDIA ON GLOBAL WARMING MATERIALS ON CREATIVITY CLASS X HIGH SCHOOL STUDENTS

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### ABSTRACT

*This research aims to produce interactive learning media that is valid, and practical towards the creativity of Physics students in class X SMA/MA. The development method is Research and Development (R&D) with the Plomp model which includes three stages, namely: Preliminary Research Phase, Prototype Development Phase, and Assessment Phase. The instruments used in this research are validity questionnaire, practicality questionnaire, and observation sheet. The results showed that interactive learning media had validity with an average score of 90.66% with a very valid category. And practicality with an average score of 93.8% towards the creativity of Physics students in class X SMA / MA. As for the level of implementation of interactive learning media in learning is in the category "partially implemented" Percentages of Agreement are in the Good Agreement criteria. So it can be concluded that the interactive learning media that has been developed is valid and practical, so it can be used as teaching material in the learning process.*

**Keywords:** Interactive Learning Media, Creativity

### A. INTRODUCTION

Participant educate on 21st century now This need to have creativity (Ananda, Roza, & Deswita, 2023). Creativity is an ability that must be possessed by students to find and create something new, new ways, and new models for the learning process by bringing students' imaginations to life in all subjects including Physics (Yasiro, 2021). Creativity is also important for students to provide various solutions to the problems faced (Ananda P. N., 2021).

Based on the data that has been traced about the creativity of students is not encouraging, the low creativity of students can be seen in the learning process when working on the questions given (Ridha, 2022). This is in accordance with research conducted by (Ananda P. N., 2021) saying that students' creativity skills are only 39.7%. And based on the results of interviews at SMAN 2 Kota Sawahlunto in class X has implemented the independent curriculum. The name of the educator who teaches in class X is Mrs. Rinilda, S.Pd, in learning students have difficulty solving a problem and students do not understand when doing exercises. During the learning process students tend to be passive and students find it difficult to find solutions or ways to overcome problems related to physics.

The low creativity participant educate due to by a number of factor namely : the first factor, learning factors that are still conventional (Ananda P. N., 2021), and physics learning in schools still uses conventional media and methods (Rofiqoh, 2020). The second factor, learning media that are still minimal to stimulate creativity abilities that

integrate modern technology (Almuharomah, 2019). And the third factor, namely other factors that can affect a person's creativity such as: social environment, parental attitudes, number of family members, birth order, parenting patterns, school environment and intrinsic motivation (Wijayanti, 2021). Based on the three factors above, it can be seen that there is an imbalance between the teaching materials used by educators and the teaching materials needed by students. Therefore, if students have high creativity, students will be active in learning and vice versa if students are passive in learning, it will have an impact on student creativity.

If creativity No overcome This will have an impact on the lack of interest of students in studying physics because students find it difficult to understand the material being discussed (Paoliana, 2020), another impact is that students are less active and creative in learning (Nuha, 2020). There have been many studies conducted to overcome the problem of student creativity, by developing teaching materials in the form of interactive learning media. The basis for the development carried out by researchers is seen from things that have been done by previous researchers to overcome the problem of low student creativity, namely by "developing interactive learning media for student creativity". The shortcomings in the basis of the development of interactive learning media carried out by researchers where previous researchers developed interactive learning media still on curriculum 13 where at this time the curriculum has been replaced with the independent curriculum so here the researcher makes an innovation from previous researchers by developing interactive learning media using the independent curriculum. Then For the previous researcher's instructions for use, there were none in the learning media, and for the previous research practice questions, they only contained multiple choice questions, whereas those developed by the researcher already contained questions in the form of *mind mapping*, posters, group assignments, and *games*. (Gulo & Harefa, 2022).

"Development of interactive learning media for student creativity". The basis for the development of interactive learning media conducted by researchers is based on previous research where previous research developed interactive learning media using curriculum 13 at the IX grade high school level, this development uses the ADDIE model and previously developed learning media in the form of *3D cartoons* while what researchers will develop is in the form of *Flipbooks* and learning materials and curriculum used are different. The interactive learning media created by previous researchers were less interactive so that students did not interact too much on the learning media. So researchers want to develop learning media that students can interact and also put forward solutions to a problem (Putra, 2021).

In relation to this, the researcher provides a solution to overcome the problem, namely by developing an interactive learning media product. The interactive learning media developed already includes an independent curriculum on global warming material in class X towards student creativity. Based on the description above, the researcher conducted a development research entitled "**Development of Interactive Learning Media on Global Warming Material on High School Student Creativity**"

**B. RESEARCH METHODS**

The research method used is the *Research and Development* (R&D) method using the Plomp model which includes three stages, namely preliminary research , development phase ( *prototype or development or prototyping phase* ), and research phase ( *assessment phase* ).

1. Preliminary Research

**Needs analysis** stage is carried out with the aim of finding out what needs are required by students to overcome problems found in learning activities so that the development of teaching materials is needed. Then a **literature analysis** is conducted by analyzing theories and concepts related to research and reviewing relevant research to strengthen the product to be developed. In this stage, an analysis of the curriculum and materials that have been adjusted to the Learning Outcomes (CP) is also conducted.

2. Development Phase ( *Prototype Or Development Or Prototyping Phase* )

This stage is a continuation of the first stage, which aims to produce a *prototype of* interactive learning media development for students' creativity in valid global warming learning. The activity stages are designing a *prototype* , conducting formative evaluations and revising *the prototype* . The data collection instruments at this stage can be seen in table 1:

**Table 1.** Data Collection Instruments

Data	Instrument
Test Validity	Questionnaire validation product For evaluate instructional Media interactive to creativity participant educate on learning global warming

3. Phase ( *Assessment Phase* )

The purpose of the assessment stage is to see the practicality of prototype II of the interactive learning media resulting from the development phase. The level of practicality is seen from the answers to the practicality questionnaire by 1 physics educator and the practicality questionnaire by 20 students. The implementation of interactive learning media in the learning process is seen based on the observation sheet by 2 observers. The data collection instruments at this stage can be seen in table 3.

**Table 2.** Data Collection Instruments

Data	Instrument
Test Practicality	Questionnaire practicality of learning media interactive to creativity by educator And participant educate on learning

Test Implementation of learning media interactive to creativity team educate	global warming Sheet observation of learning media interactive to creativity team educate
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**C. RESULTS AND DISCUSSION**

Based on the objectives and procedures of the research, namely developing interactive learning media for valid and practical student creativity. The Plomp development model consists of 3 stages, namely:

**1. Preliminary research**

Results from **analysis need** that is interview with educator And participant educated at SMAN 2 Sawahlunto City . And the results from **analysis literature / study library** is to strengthen interactive learning media for the creativity of students that is developed can seen on table 7 .

**Table 3.** Literature analysis/library study

Aspect	Theory Supporters	References
Stage development	Primary research, prototyping, and assessment phase	Nieeven & Plomp in Sari 2018
Creativity	a. Fluency ( fluency ), b. Flexibility ( flexibility ), c. Originality ( authenticity ), d. Elaboration ( detail )	(Ningsi, 2019):
Instructional Media	1. Types of learning media as well as steps media creation 2.	(Sidharta, 2005), (Santiana, 2023)
Material physics	Global warming	Book participant educate class X curriculum independent

**2. Prototype Development Phase ( Development or Prototyping Phase )**

Results from the *prototype* development stage in the form of valid interactive learning media. *The prototype development* stages are as follows:

a. *Designing a Prototype*

*prototype* design stage, interactive learning media design and research instrument design were carried out. After the initial stage of designing interactive learning media, the next stage is the development of interactive learning media. The results of the development of interactive learning media can be seen in Figure 1:



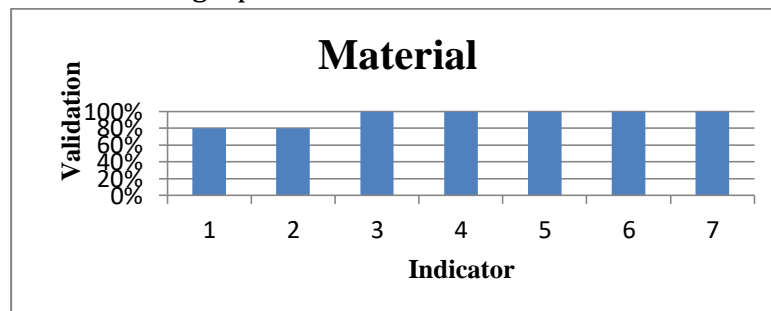
Figure 1. Display of Interactive Learning Media

b. Formative evaluation

The purpose of this stage is to produce interactive learning media for students' creativity in physics learning for grade X of SMA/MA that is valid. The data validity test was obtained from filling out the material validity questionnaire, media validity questionnaire, and language validity questionnaire. The questionnaire was filled out by 1 material expert, 1 language expert, and 1 media expert. The following is the trial data:

1) Test of Validity of Material/Content

The content validity test indicators for interactive learning media teaching materials consist of 7 statements, the lowest score for each statement is 1 and the highest score is 5. The content validity test results data can be seen in graph 1:

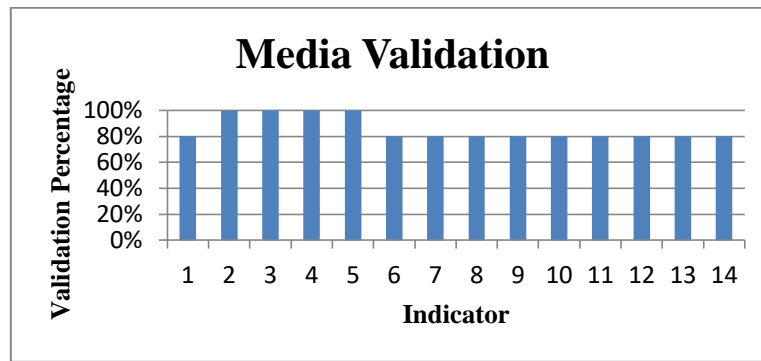


Graph 1. Material Validation Test Results

Graph 1 shows the average value of the validity results of the material from 1 validator. The results obtained from the validator Allan Asrar, M. Si were 94.24% with a very valid category.

2) Media Validity Test

The media validity indicator consists of 14 statements. The media validity value by 1 validator can be seen in graph 2:

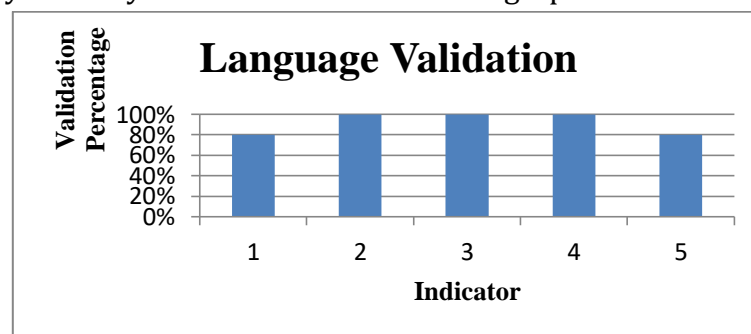


Graph 2. Media Validation Test Result Data

Graph 2 shows the average value of media validity results from 1 validator. The results obtained from validator Dewi Juita, M. Pd were 85.17% with a very valid category.

3) Language Validity Test

The language validity indicator consists of 5 statements. The language validity value by 1 validator can be seen in graph 3:



Graph 3. Language Validation Test Results

Graph 3 shows the average value of the language validity results from 1 validator. The results obtained from validator Abdul Basid, M. Pd are 92% with a very valid category. The average value of the validity of interactive learning media can be seen in table 8:

Table 4. Validator Average Value

Indicator	Percentage	Category
Eligibility material content /	94.28%	Very Valid
Eligibility construction	85.71%	Very Valid
Eligibility Language	92%	Very Valid
<b>Average percentage</b>	<b>90.66%</b>	<b>Very Valid</b>

c. Prototype Revision

At this stage, interactive learning media *prototype* II was produced for student creativity in physics learning for class X of SMA/MA. However, there were several product revisions obtained from construction validity. Suggestions from the validator can be seen in table 9.

**Table 5.** Product Revision Results

No	Before Repair	After Repair
1	<p>Cover view before repair product on material global warming</p>  <p>Previously used fonts in the cover very diverse so that not enough interesting.</p>	<p>Cover view after repair product on material global warming</p>  <p>After that cover on product made using the same font from cover to with exercise.</p>
2	<p>Media view before fixed</p>  <p>Previously media display using Lots the color that makes the reader Confused And No</p>	<p>Media view before fixed</p>  <p>Afterwards media display using color and matching fonts And The same so that make the look interesting.</p>

interesting .

3 Appearance prayer Study before fixed



Previously prayer Study No use phrase *In the name of Allah* .

Appearance prayer Study after fixed



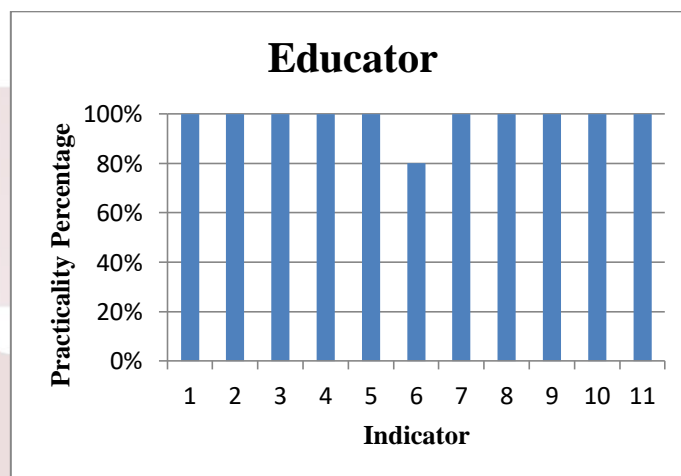
Afterwards prayer Study Already fixed And Already use phrase *In the name of Allah* .

### 3. Research Phase ( Assessment phase )

Results from stage This is to see the practicality of *the prototype II* interactive learning media from the development phase. The level of practicality is seen from the answers to the practicality *questionnaire* by 1 physics educator and the practicality questionnaire of 20 students of class XE2 SMAN 2 Kota Sawahlunto. The implementation of interactive learning media in the learning process is seen from the results of 2 observers.

#### a. Practicality test of interactive learning media

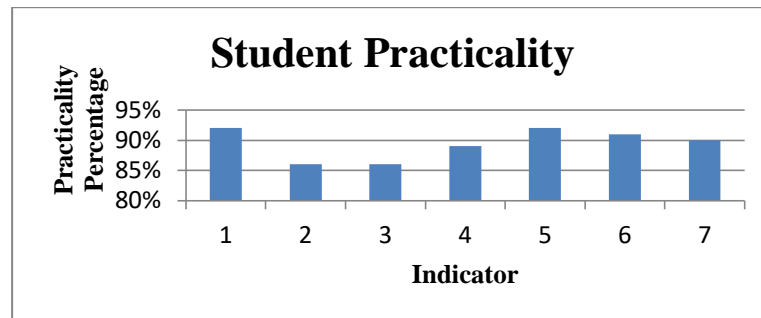
The practicality test was obtained from distributing questionnaires to 1 physics educator at SMAN 2 Kota Sawahlunto and 20 students of class XE2 at SMAN 2 Kota Sawahlunto. The statements of the practicality test indicators by educators were 11 statements and students were 7 statements. The data obtained from the results of the practicality of interactive learning media by 2 educators can be seen in the following graph 4:



Graph 4. Results of Practicality Test by Physics Educators

Graph 4 above shows the value of the results of the practicality questionnaire conducted by 1 physics educator obtained an average result of

98.18% with a very practical category. The product practicality test by students was given to 20 students of class SMAN 2 Kota Sawahlunto. The results of the product practicality analysis by students can be seen in graph 5 below:



Graph 5. Results of Practical Test by Students

Graph 5 shows that the value of the results of the practicality questionnaire of students filled out by 20 grade X students obtained an average result of 89.42% with a very practical category. The product can be used as a learning medium.

b. Testing the Implementation of Interactive Learning Media

The implementation test in learning was observed by 2 observers using an observation sheet. Observations were carried out by observers who focused on aspects of learning implementation. The results of observations of the implementation of interactive learning media are completely presented in table 10.

Table 6. Summary of Results of Practical Test of Interactive Learning Media

No	Aspect	Phase	Test try Educator	Test try Participant educate	Average	Category
1	Observation of learning media interactive	Session look at advance form of agreements	3.71 75%	3.6 80%	3.65 77.5%	Very practical <i>Good Agreement</i>
2	Practicality of learning media interactive		98.18%	89.42%	93.8%	Very practical

Table 10 shows that the interactive learning media developed is very practical because it has met two predetermined criteria. The results of the research of educators and students stated that interactive learning media is categorized as very practical. The level of implementation is in the category of

"mostly implemented" and *the percentages of agreement* for face-to-face sessions are in the category of *Good Agreement*. The results of the validity and trials that have been carried out on the interactive learning media developed are valid and practical. So that interactive learning media can be used by educators and students as teaching materials in class X on global warming material. This research is in line with the results of research from (Gulo & Harefa, 2022) and research (Putra, 2021).

#### D. CONCLUSION

Teaching materials have been developed using the *Plomp model* in the form of interactive learning media on global warming material on the creativity of students in class Phase E of SMAN 2 Kota Sawahlunto. And valid and practical interactive learning media have been produced. Interactive learning media on global warming material on students' creativity both in terms of material, media, and language with an average value of 90.66% with a very valid category. Interactive learning media on students' creativity has an average value of 93.8% with a very practical category. As well as at the level of implementation of interactive learning media on students' creativity in the category of "partially implemented" and *Percentages of Agreement on the Good Agreement* criteria. So interactive learning media that has been developed can be used as teaching materials in the learning process.

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