

Development of Powtoon-Based Learning Media in SMP Negeri 2 Percut Sei Tuan

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ABSTRACT

PowToon-based learning media is one of the media presented in video format that can be used as an effective learning medium. The purpose of this study was to develop a valid and practical Powtoon-based environmental mathematics lesson based on statistical data for Grade VII students of SMP Negeri 2 Percut Sei Tuan. The subjects of this study were 20 class VII students who were selected using a purposive sampling method. A 4D approach (Define, Design, Development, Dissemination) was used to develop this learning. To demonstrate statistical material in video format, the results of the research are used as learning media for statistical material. The product received a 0.85 score from 3 validators based on very valid criteria. The practicality of the product received a practicality rating of 82.91% with very practical criteria, as evidenced by the results of 20 students' answers regarding the use of a PowToon-based mathematics learning environment on statistics material. In addition, the PowToon-based learning environment is distributed via YouTube for easy access for students. Thus, it can be said that the PowToon-based mathematics learning environment is a valid and practical tool that can be used as a mathematics teaching tool.

Keywords: *Learning Media, Powtoon, Presenter*

PRELIMINARY

The science of mathematics is characterized by its hierarchical arrangement of abstract ideas or concepts (Rosmayadi, 2017). Mathematics education plays an important role in the lives of everyone. Because the mathematics cannot be separated from everyday life, mathematics subjects must be provided to all students from elementary school onward.

Due to the rapid development of the global situation, mathematics has become a science that plays an important role in almost everything and is a part of science. The participants' actual needs have increased as a result. Ariani & Kenedi (2018) also conclude that mathematics can significantly influence participants' thinking processes, both in action and as a technique. As mathematics becomes more meaningful and interesting, media support is necessary to facilitate the learning process for students.

According to Sukmanasa et al., (2020), learning can be a powerful tool for creating efficient and effective learning. Using learning media helps to convey material more clearly and more interesting because it allows us to see the material more clearly and more interestingly. Learning media can assist in this process.

According to Nor et al. (2021), One of the programs that can be developed into an interesting learning media is PowToon media. Furthermore, according to Mutala'ah et al. (2021), powtoon-based learning media is one of the media that can be used to provide learning material.

The results of interviews conducted with teachers of class VII I at SMP Negeri 2 Percut Sei Tuan indicate

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that teachers have difficulties learning mathematics.

The teaching and learning process can be hindered by several factors. Thus, the math class is still in a restricted learning state, and therefore the week is short. Furthermore, practitioners do not provide optimal materials because the learning process takes a significant amount of time using blackboard-based learning media. In response to the student questionnaire, blackboards, books, and student worksheets (LKPD) were found to be the most commonly used learning media for learning mathematics.

Students' ability to learn mathematics is significantly impacted by the lack of effective, interesting, and efficient learning media. As stated by Tyaningsih & Samijo (2019), interactive multimedia is one way to make learning more interesting and produce positive student responses. This is consistent with Subarinah et al. (2021) finding that one of the reasons students fail to learn mathematics is because they do not use media and learning aids.

According to the problems mentioned above, educational media must be developed for teachers and students to facilitate the learning process for statistics. As a result, the researcher is interested in conducting research on "Development of PowToon-Based Learning Media for Students in Class VII of SMP Negeri 2 Percut Sei Tuan."

THEORETICAL STUDY

To increase student enthusiasm for participation in the learning process, educators need to develop electronic-based learning media, according to (Puspitarini & Hanif, 2019). There are four types of learning media, according to (Satrianawati, 2018): (1) visual media contains several elements; (2) audio media is comprised of audio, musical instruments, and songs; (3) audio-visual media is media that can display images and sound simultaneously, such as film, television, and computer media; (4) multimedia media that combines

media into one. In order to achieve learning objectives, learning media must motivate students. The current situation requires the development of Powtoon-based video learning media. Powtoon-based video media can also be used to address student differences in learning styles. It has animation features, including handwriting animation and cartoon animation, which can be used for the creation of learning media, as well as transition effects and timeline settings, according to Divine and Desyandri (2018). Pais et al. (2017) note that Powtoon has several general advantages, including 1) the ability to present topics in an interesting manner and share them with others, 2) attracting the attention of students, 3) students are better able to comprehend the material and the presentation is more straightforward. In addition to integrating a wide variety of formats and media, the basic version is free of charge, which greatly enhances the integration capabilities of visual, auditory, and motion sources.

RESEARCH METHODS

In this study, the research design is Research and Development (R&D). R&D is a method for producing a specific product and testing its effectiveness (Sugiyono, 2017). Research and Development are conducted following the 4-D development model, which consists of defining, designing, developing, and disseminating products.

This research was conducted at SMP Negeri 2 Percut Sei Tuan, Gambir street Pasar 7, Percut Sei Tuan District, Deli Serdang Regency. This research was conducted in the second semester at SMP Negeri 2 Percut Sei Tuan in 2021/2022.

The subjects in this study were class VII students of SMP Negeri 1 Percut Sei Tuan TP 2021/2022. The object of this research is Class VII-3 of SMP Negeri 2 Percut Sei Tuan TP 2021/2022 using Powtoon-based learning media on statistics material. The procedure in this study is divided into four stages, namely:



Figure 1. 4D Stages

Data collection techniques used in this study include questionnaires (questionnaires). In this study, the questionnaire was given to: first, lecturers as product

validation experts and second, students from class VII-3 junior high schools as many as 20 students with 20 statement items.

Instruments as data collection tools and instruments commonly used in research are a list of several questions, such as a questionnaire, submitted to each respondent who is the research sample. Then there is the instrument used to collect data for this development study which is a questionnaire.

The feasibility of learning media developed in this study has several criteria that must be met to use appropriate learning media. First, the media must look at expert opinions/judgments to get valid criteria. The formula used to measure the validity of the PowToon-based mathematics learning media is the Aiken formula with Aiken's V index as follows:

$$V_{vt} = \frac{\sum s}{[n(c - 1)]} \dots \dots \dots (1)$$

Information:

$$s = r - lo$$

lo = The lowest validity rating score

c = The highest validity rating score

r = Number given by an appraiser

n = Number of Validators (Assessors)

Table 1. Media Validity Criteria

No	Score	Criteria
1	0.81-1.00	Very Valid
2	0.61-0.80	Valid
3	0.41-0.60	Enough
4	0.21-0.40	Invalid
5	0.00-0.20	Invalid

Source: (Rahmat & Irfan, 2019)

Second, the media must be given practical criteria that come from students' responses to the learning media used. The formula for measuring the utility of PowToon-based math learning media is:

Information:

$$V_{pg} = \frac{TSe}{TSh} \times 100\% \dots \dots \dots (2)$$

Information:

Vpg = User Validation

TSe = Total Empiric Score Achieved

TSh = Expected Total Score

Table 2. Practicality Criteria

No	Score	Criteria
1	81.00% - 100%	Very Practical
2	61.00% - 80.00%	Practical
3	41.00%-60.00%	Enough
4	21.00% - 40.00%	Less Practical
5	0.00% - 20.00 %	Impractical

(Akbar, 2013)

RESEARCH RESULT

The product made in this study is PowToon-based mathematics learning media which is presented in video format which can be viewed in MP4 video form or accessed via YouTube to provide students with flexibility in learning with PowToon-based videos. In order to obtain valid and practical PowToon-based mathematics learning media, there is a process of analysis that must be followed before implementation. In the presentation below, you will find the results of the validity analysis, practicality analysis and discussion.

Results Validity by Media Experts

The media validation has been carried out by one media expert, who is a lecturer in mathematics education at UMN Al-Washliyah. The purpose of this validation is to determine the quality of the PowToon-based mathematics learning media. The report of the validation is shown in Table 3.

Table 3. Validity Results by Media Experts

Poorly Rated	Validity Score	Criteria
Media Display Design	0.89	Very Valid
Operational Ease	0.86	Very Valid
Usage Instructions	0.86	Very Valid
Average Score of Validity	0.87	Very Valid

Table 3 shows that the PowToon-based mathematics learning media validation score which was validated by media experts got a score of 0.87 with very valid criteria.

Results of Validity by Material Experts

In order to determine the quality of the PowToon-based mathematics learning media developed by SMP Negeri 2 Percut Sei Tuan, a class VII math teacher conducted material validation. In Table 4, you will find the results of the material assessment carried out by material experts.

Table 4. Validity Results by Material Experts

Rated aspect	Validity score	Criteria
Content Eligibility	0.92	Very Valid
Learning process	0.84	Very Valid
Evaluation	0.77	Valid
Language	0.92	Very Valid
Average Score of Validity	0.86	Very Valid

Table 4 shows that the validation score of PowToon-based mathematics learning media by material experts gets a score of 0.86 with very valid criteria.

Results Validity by Users

One teacher from SMP Negeri 2 Percut Sei Tuan performed user validation as a result of using PowToon-based mathematics learning media. It is the purpose of this validation to determine the quality of the PowToon-based mathematics learning media that has been developed. The results of the user assessment are shown in Table 5.

Table 5. Validity Results by Users

Evaluation	Validity Score	Criteria
Media Validity Results by Users	0.81	Very Valid
Media Validity Results by Users	0.83	Very Valid
Average score of validity	0.83	Very Valid

Table 5 shows that the PowToon-based mathematics learning media validation score that was validated by users got a score of 0.82 with very valid criteria.

Average Results Media Validity

Media expert validators, subject matter experts, and users conducted the validation of PowToon-based mathematics learning media. As a final result of validating PowToon-based mathematics learning media, it can be seen in Table 6 the average score by 3 validators.

Table 6. Average Results of Media Validity

Evaluation	Validity Score	Criteria
Results Validity By Media Experts	0.87	Very Valid
Validity Results By Material Experts	0.86	Very Valid
Media Validity Results By Users	0.82	Very Valid
Average score of validity	0.85	Very Valid

In Table 6 it shows that the average score of the validation of PowToon-based mathematics learning media that has been validated by 3 validators gets a score of 0.85 with very valid criteria.

Media Practicality Analysis Results

Based on the results of the student response instruments given during the limited trial of 20 students in class VII-3 of SMP Negeri 2 Percut Sei Tuan, the practicality assessment of the PowToon-based mathematics learning media can be observed. The results of the student response questionnaire assessment can be found in Table 7.

Table 7. Media Practicality Results

Total students		Number of Indicators		Total Score	Maximum Total Score
Male	Female	(+)	(-)		
12	8	8	7	995	1200
Students	Students				
					82.91
Practical Presentation					%
Practicality Criteria					Very Practical

Table 7 shows that the practicality percentage of PowToon-based mathematics learning media reaches 82.91% with very practical criteria.

DISCUSSION

Results and Uses of PowToon Media

In order to prepare the PowToon-based mathematics learning media for Class VII statistics, data analysis calculations have been conducted using PowToon-based mathematics learning media. In the classroom, the use of these learning media is possible using LCD, projector screens, and computers. PowToon-based learning media is available in MP4 format for offline use. With the school's facilities and infrastructure, PowToon-based mathematics learning media is used to teach students mathematics, while students receive a 15-minute advertisement video with PowToon-based learning media. In order to provide students with an interactive experience, the researcher provides LKPD, which they can complete in order to answer questions.

PowToon Media Validity Results

According to the validation results obtained by three validators, the PowToon-based mathematics learning media was awarded a score of 0.87 based on criteria that are very valid by media experts. As assessed by user validators, PowToon-based mathematics learning media received a score of 0.86 on very valid criteria from material experts. Lastly, PowToon-based mathematics learning media received a score of 0.82 on very valid criteria. The validity score of the PowToon-based mathematics learning media is 0.85 based on the assessment by the three validators.

PowToon Media Practical Results

The practicality of the media in this study can also be seen from the results of the student response questionnaire, and if practical responses can be obtained, it can be said that the learning media developed are practical. According to Van Den Akker (in Rochmad, 2012), a learning tool developed is considered practical if a practitioner or expert has demonstrated that it can be applied in practice. Based on the results of the student questionnaire, it can be concluded that the media developed in this study are

practical if practical responses are obtained. This statistic achieves a utility score of 82.91% on a very practical basis.

PowToon Media Development Stages

In developing PowToon-based learning In developing PowToon-based learning media, it uses a research model developed by Thiagarajan (in Kurniawan & Dewi, 2017) which consists of 4 namely define, design, development, and dissemination.

1. Defining Stage

This stage allowed the researcher to examine the limitations of the learning process and the need for learning media for students in class VII at SMP Negeri 2 Percut Sei Tuan to learn mathematics. In order to find learning activities in schools and gather the necessary information, (Obilor & Miwari, 2022) suggest that interviews and observations will be necessary at the definition stage. The next step is to analyze the concept or determine what materials will be displayed in the learning media, analyze KI and KD, and formulate learning objectives for the media that will be developed. As part of the learning objectives, students will be able to determine 1) the size of the center of data using the average/mean value of data, 2) the size of the center of data using the median/median value of data, and 3) the measurement of data centering based on the value that frequently appears/mode of the data.

2. Design Stage (design)

To facilitate the design of learning media, the researcher selects the media, selects the format, prepares flowcharts and storyboards.

3. Development stage (development)

After creating the learning media, it was validated by three validators and revised based on the suggestions and inputs of the validators, then a limited trial was conducted on 20 students of class VII-3 at SMP Negeri 2 Percut Sei Tuan. The researchers modified or improved the media being developed in response to the feedback and suggestions provided by experts, users, and students based on the evaluation results. These are some pictures of PowToon-based learning media that have been revised.

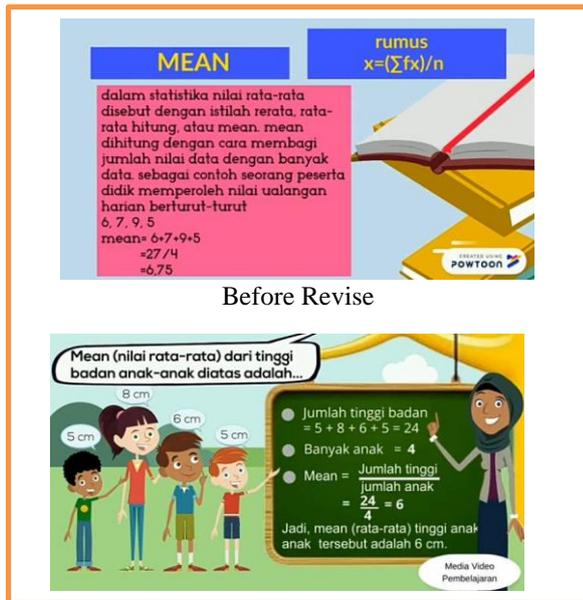


Figure 2. Media Before and After Revise

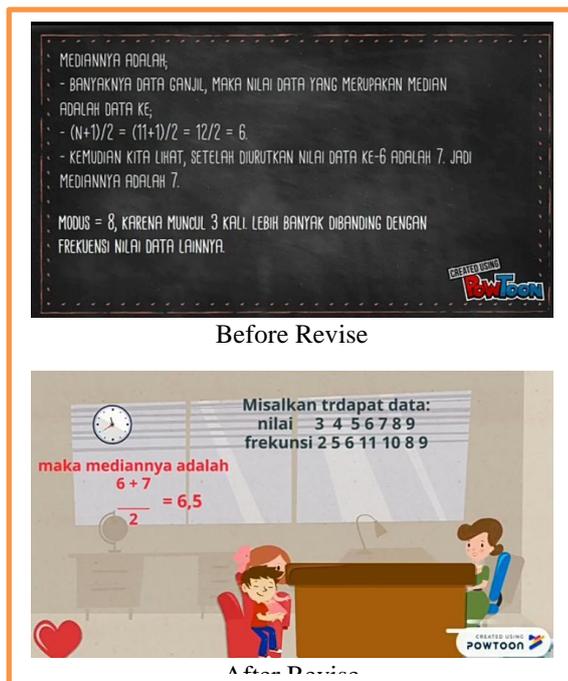


Figure 3. Before and After Media Repair

4. The last stage of Dissemination (dissemination)

In order to facilitate teachers and students' access to learning media based on PowToon, the researcher disseminated these learning media via YouTube.

CONCLUSION

After conducting research, analyzing data, and discussing the results, the developed PowToon-based mathematics learning media has been rated as a very valid criterion for media reviews with a score of 0.87 and 0.86 respectively. As a result of this analysis, it has an average media validity of 0.85 for very valid criteria

based on its material rating of 0.82 and its user rating criteria of very valid criteria. As a result of student feedback, the PowToon-based mathematics learning media scored 82.91% on the practicality assessment, which is a highly practical criterion. As a result, PowToon-based mathematics learning media are ideal for teaching statistics at SMP Negeri 2 Percut Sei Tuan for class VII.

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