



Article

Development of Pythagorean Audiovisual Learning Media Based on Web-app Powtoon

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ABSTRACT:

Learning media production is expanding quickly as a result of information and technological advancements. Since the learning process frequently involves abstract concepts or knowledge that is outside of students' daily experience, it requires a learning medium that can offer visualization along with audio that offers a variety of stimuli to support the learning process and ensure that it is carried out properly. Determine the outcomes and assess the viability of development to learn what the eighth-grade SMP/MT students thought of the audiovisual learning materials for Pythagorean material that had been created. Research and development (R&D), which has been adjusted by Sugiyono, has been restricted by researchers, and consists of 6 steps, according to Borg and Gall, is the methodology employed in this study. Penelitian dilakukan di MTsN 2 Tulungagung. Ada 21 siswa yang diikutsertakan dalam penelitian ini. Analisis statistik deskriptif adalah metode analisis data yang digunakan. Lembar validasi ahli materi dan media serta angket respon siswa merupakan alat pengumpul data. Sementara siswa mengomentari daya tarik produk, para profesional mengevaluasi kelayakan produk yang dikembangkan. Penelitian ini menghasilkan sumber belajar siswa kelas VIII SMP/MTs berupa konten audiovisual Pythagoras berdasarkan materi Pythagoras. The resulting product received an average assessment of material of 4.71, with a presentation of 94.2% included in the "Very Eligible" category. At the same time, the assessment in terms of media got an average rating of 4.79 with a presentation of 95.8% included in the "Very Eligible" category. Student responses in the small group test got a percentage of 82.26% with the category "Very Interesting" or had a positive response.

Key words: *Learning Media, Audiovisual, Powtoon*

INTRODUCTION

Information and communication technology development is moving so fast and penetrates into all sectors of life. With the rapid growth of information technology, we should use it wisely and responsibly to improve human resources.¹ We can improve these human resources through education, which aims to strengthen them to align with the increasingly rapid information and communication technology changes. Along with the development of information and technology, the development of learning media is also growing rapidly. Accessing the internet makes it easier to find information, data, pictures, films, videos, etc.

¹ Rindawati Rindawati, Salsabilla Khosyi²Atunnisa, and Rahadi Herlambang, 'Pemanfaatan Tik Dalam Pengembangan Sumber Dan Media Pembelajaran Di Era Society 5.1', *Jurnal FATEKSA: Jurnal Teknologi Dan Rekayasa*, 6.2 (2021), 24–31

The learning process is frequent. When faced with material that can be said to be abstract or beyond the daily experience of students, a learning media is needed that can provide good visualization.² Visualization through learning media is one of the ways that teachers can do with students to concretize or clarify something abstract for students.³

Making technology-based learning media that is easy to use for teachers and combined with an integrated learning approach which is an implementation based on the 2013 curriculum that allows students to search, explore, and get concepts from a science that is being studied. The use of learning media is seen as very supportive of the learning process in the 2013 curriculum. One of the learning media that can be applied to students is audiovisual media in the form of video animation.⁴

video as audiovisual learning media is used as a learning tool, video can be divided into two categories: audiovisual media, or material that includes sound, movement, and the ability to perceive an object's shape, which is the most complete type of media. When projected onto a large screen with a projector or displayed on a monitor, the information delivered through these media takes the shape of animated or moving documents that may be seen and heard.⁵ The genre of audiovisual instructional resources includes animated videos. Teaching materials that mix visual and auditory elements are known as audiovisual teaching materials or see-hear teaching materials. While auditory information is meant to excite pupils' hearing, visual material is meant to stimulate their sense of vision. Teachers can design a higher-quality learning process using a combination of these two resources since communication is enhanced.⁶

According to Riyana, learning video media is an audiovisual media that presents audio and visuals that contain learning messages containing concepts, principles, procedures, and theory of application of knowledge to assist understanding of learning material.⁷ Advantages of audiovisual media in learning, namely enriching the presentation of material, the material can be repeated on parts that are unclear or not yet understood by students, very suitable for delivering material in the psychomotor aspect, videos are faster in conveying messages, namely learning material, and videos clearly show all stages in learning.⁸

One of the media that supports the learning process is media that is assisted by applications such as media made with the help of the Powtoon application. Powtoon is a web-based animation tool that enables educators to quickly and easily produce animated content for online use as well as presentations and educational materials. Powtoon has the advantage that it is easy to use to make videos, especially animations that interest junior high school students in learning and paying attention. There are many animation options that you want to use. Besides that, you can also add pictures that the video maker wants to include.

Theorem Pythagoras is one of the many mathematics learning materials taught in schools. Understanding of the Pythagorean concept can be built from understanding the concept of triangles, then combined to construct the theorem pythagoras. There are alternative solutions to understanding the concepts in the Pythagorean material: understanding and applying aspects. Understanding is an initial aspect that students must have in understanding concepts according to Bloom's Taxonomy which Anderson and Krathwohl have revised. The understanding aspect

² Nurul Audie, 'Peran Media Pembelajaran Meningkatkan Hasil Belajar Peserta Didik', *Prosiding Seminar Nasional Pendidikan FKIP (Vol. 2, No. 1, Pp. 586-595)*, 2.1 (2019), 589–90.

³ Haris Budiman, 'Penggunaan Media Visual Dalam Proses Pembelajaran, Al-Tadzkiyyah: ', Vol. 7, (2016), h. 177', *Jurnal Pendidikan Agama Islam*, 7.45 (2016), 177.

⁴ Mawarni, 'Pemanfaatan Media Pembelajaran Teknologi Informasi Dan Komunikasi Pada Kelas V SDN 169 Pekanbaru', 5 (2021), 96.

⁵ Dominicus Juj, *Membuat Video Klip Dengan Ulead Video Studio & Ulead Cool 3D* (Jakarta: PT Elex Media Komputindo Kelompok Gramedia, 2006).

⁶ Andi Prastowo, *Pengembangan Bahan Ajar Tematik Tinjauan Teoritis Dan Praktis* (Jakarta: Kencana Prenadamedia Group, 2014).

⁷ Cheppy Riyana, *Pedoman Pengembangan Media Video* (Jakarta: P3AI UPI, 2007).

⁸ Ferry Ferdianto Setiyani, Dina Pratiwi Dwi Santi, 'Pemanfaatan Powtoon Sebagai Salah Satu Alternatif Media', *SELAPARANG : Jurnal Pengabdian Masyarakat Berkemajuan*, 4.November (2020), 468–73.

focuses on conceptual knowledge. Understanding is interpreting, exemplifying, classifying, summarizing, concluding, comparing, and explaining or modeling causality.⁹

This research was conducted with the aim of knowing (1) understanding the validity developed audiovisual learning media (2) understanding the responses of students after learning with powtoon based audiovisual learning media.

METHOD

The type of research conducted is the research and development method or Research and Development (R&D). According to Borg and Gall development research is a process used to develop and validate a product in education. Meanwhile, Seals and Richey stated that research development is a process of a systematic review of the design, development, and evaluation of programs and learning products that must meet the criteria of validity, practicality, and effectiveness.¹⁰

This research refers Borg and Gall research that Sugiyono has modified ten procedures that were carried out. However, the authors limit the steps research development of ten steps to six steps, namely: (1) Potential and Problems, (2) Planning, (3) Product Design, (4) Design Validation, (5) Revision Products, (6) Small-scale product trials.

Instrument data collection in the form of sheet validation media expert, sheet validation expert materials, and sheets questionnaire response student use evaluation Likert scale. Teknik sheet-based data analysis validation and questionnaire response students obtained through the formula:

Table 1. Likert Scale

Category	Score
Very Valid	5
Valid	4
Enough Valid	3
Less Valid	2
Invalid/not valid	1

We enter the total rating score obtained into the Likert scale category level with the formula:¹¹

$$P_k = \frac{S}{N} \times 100\%$$

Description :

P_k =Feasibility scale category value

S =Total score obtained

N =Total ideal score

The level of validity and interest/attractiveness can be seen in the following table:

Category	Ideal Percentage (%)
Very Valid/Very Interest	81 - 100
Valid/Interest	61 - 80
Enough Valid/Enough Interest	41 - 60
Less Valid/Less Interest	21 - 40
Invalid/not valid/not interest	0 - 20

⁹ Annisa Restianingsih and Heni Pujiastuti, 'Analisis Kesulitan Kemampuan Pemahaman Konsep Siswa SMP Pada Materi Pythagoras', *Didaktis: Jurnal Pendidikan Dan Ilmu ...*, 20.3 (2020), 210–22.

¹⁰ Hanafi, 'Konsep Penelitian R&D Dalam Bidang Pendidikan', *Jurnal Kajian Keislaman*, 4.2 (2017), 129–50.

¹¹ Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif Dan R&D* (Bandung: Alfabeta, 2013).

RESULT AND DISCUSSION

The initial step in making audiovisual powtoon -based learning media is to make non-participatory observations in class VIII B MTsN 2 Tulungagung. From the observations, it is known that the teaching materials used by students in class VIII B MTsN 2 Tulungagung during distance learning in mathematics are textbooks or modules, which, after cross-checking by researchers, explain the evidence to the implications of using pythagoras still limited.

Table 2. The results of the media development need analysis

Category	Description
Subject	Theorem Pythagoras.
Learning media used in schools	None.
Condition of students during learning	Students find it difficult to apply abstract material, so we need a learning media to share information/materials.
Student device	From the results of observations of all students of class VIII have a smartphone.

The design stage of audiovisual powtoon - based learning media for class VIII SMP/ MTs refers to the 2013 curriculum, core competencies, basic competencies, and indicators in theorem material Pythagoras. Audiovisual powtoon -based learning media planning activities in theorem subjects Pythagoras class VIII SMP/ MTs in the form of collecting material as reference material, making animations, and providing tools and materials for media development.

Based on field observation data and materials prepared at the planning stage, the specific product to be developed is a powtoon audiovisual learning video that can help educators and students in the learning process. The following is the design of learning media development presented in the figure :



Table 3. Level of validity from the subject pythagorean

No	Variables of validity	Validity score	Categories
1	Language	95%	Very Valid
2	Quality of subject	93,4%	Very Valid
	Average score	94,2%	Very Valid

Design validation is carried out by providing audiovisual learning media products, the validation rubric, and the questionnaire. The analysis results of the average value of the material validation questionnaire on learning media fall into the "Very Valid" category. The linguistic aspect, which consists of 2 indicators, obtains an average score of 95% in the "Very Valid" category. As for the standard content aspect, which consists of 9 indicator items, it obtains an average score of 93.4 in the "Very Valid" category. The average assessment of material experts is 94.2% of the presentation is included in the "Very Valid" category.



Table 4. Level of validity from the technology experts

No	Variables of validity	Validity score	Categories
1	Language	100%	Very Valid
2	Technology	92%	Very Valid
3	Audio and visual	95,6	Very Valid
Average score		95,8%	Very Valid

The language aspect which consists of 2 indicator items obtains an average presentation score of 100% with the category "Very Valid". As for aspects of learning media consisting of 9 indicator items, obtained an average presentation score of 92% in the "Very Valid" category. In addition to the audio and visual aspects comprising eight indicator items, obtained an average presentation score of 95.6%. The media expert's average percentage score was 95.8%, including in "Very Valid" category.

Learning media that have been validated are then revised based on suggestions and criticisms from experts, but based on the results of learning media validation does not require significant revision and can be directly used for trials. Even though it does not require significant revision, the researcher still pays attention to criticism and suggestions from expert validators. Criticism and suggestions given by the material expert validator are presented in the following table:

Table 5. revision by the validator

Improvement Suggestions	Revision Results
<p>In part D, it is better to state that the ribs must be consistent, "R" or "r" because what is meant is the same, namely the ribs.</p> 	<p>In part D, it has been revised to be consistent, "r" in denoting ribs.</p> 

The steps taken after revising the product and learning media are declared fit for use with the appropriate criteria are conducting product trials. This trial was carried out on 21 class VIII students of MTsN 2 Tulungagung. The implementation was carried out at the homes of each student who remained monitoring classroom teachers and researchers. This trial was conducted to determine student responses to the development of audiovisual powtoon -based learning media in theorem learning subjects pythagoras.

In this test, each student uses a computer, laptop, or smartphone for each student and operates according to the instructions contained in the learning media. After using the mathematics learning media, students were asked to fill out a questionnaire to find student

responses. This questionnaire consists of three aspects, namely, aspects of media, material/content, and learning.

Table 6. Student response results

No	Analisis Kategori Per-aspek	Attractiveness score	Categories
1	Learning media	83,4%	Agree/interest
2	Material/content	82,14%	Agree/interest
3	Learning	81,26%	Agree/interest
Average score		82,26%	Agree/interest

Percentage of student responses to the use of audiovisual powtoon -based learning media in theorem learning subjects The Pythagoreans are categorized into three aspects. The first aspect, namely the learning media aspect, obtained an average percentage score of 83.4%. The material/content aspect obtained an average percentage score of 82.14%. The learning aspect obtained an average percentage score of 81.26%. Whereas for the average student response from each aspect, a percentage of 82.26% was obtained with a “very interesting” category or having a positive response. This is following the criteria for the percentage of student responses according to Izmi Handayani, stating that audiovisual powtoon -based learning media products in theorem learning subjects Pythagoras was declared "effective" based on the results of student responses.

CONCLUSION

research and development produce a product in the form of audiovisual powtoon -based learning media material pythagoras for student class VIII SMP / MTs. The material in learning media consists of 3 parts, (1) opening, (2) content, (3) closing. Based on the validity results by material and media experts, presentations of 94.2% and 95.8% are included in the "Very Eligible" category. In addition, based on student responses in small group tests related to learning media, the average student response from each aspect was 4.79, with a percentage of 82.26% in the "Very Interesting" category or having a positive response. So the audiovisual powtoon -based learning media in theorem learning subjects pythagoras for Grade VIII students of SMP/ MTs that was developed meets valid criteria and is suitable for use as a learning medium. The product is very interesting to use as a medium for learning mathematics.

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