International Journal of Technology and Education Research

https://e-journal.citakonsultindo.or.id/index.php/IJETER

E-ISSN: 2986-0733

Development Of An Interactive Learning Tool Based On The CANVA App For Teaching The Pythagorean Theorem To Eighth-Grade Students At Junior High School 12 Satap Tibawa

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Abstract

Canva is one of the apps that offers an easy alternative for designing. One of Canva's key advantages is that it makes it easy to create any kind of design—presentations (PowerPoint), graphics, ebook covers, videos, and infographics—using built-in animations, all of which can be published immediately anywhere. Given the issues at Junior High School 12 Satap Tibawa, the researcher was motivated to conduct research and development (R&D) using interactive learning materials based on Canva. One way to leverage advanced technology in education is through educational media that can help students understand the Pythagorean theorem, such as Canva-based interactive educational media. The purpose of this study is to examine the development and outcomes of an interactive learning medium based on the Canva application for teaching the Pythagorean theorem to eighth-grade students at Junior High School 12 Satap Tibawa. The type of research used is Research and Development (R&D). Sugiiono (2016:297) states that the R&D research method is used to develop specific products and test their effectiveness. The purpose of this study is to develop interactive learning materials on the Pythagorean Theorem for eighth-grade junior high school students. Results of the Research and Development of an Interactive Learning Medium Based on the Canva Application for the Pythagorean Theorem in Grade 8 at Junior High School 12 Satap Tibawa. Consequently, it can be concluded that the results of the development of an interactive learning medium based on the Canva application for the Pythagorean Theorem unit in Grade 8 at Junior High School 12 Satap Tibawa fall into the "very

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good" category and can be used in the classroom.

Keyword: Canva, the Pythagorean Theorem, 8th Grade, Junior High School 12 Satap Tibawa.

INTRODUCTION

Education is the process of preparing the next generation to face the global era and its challenges. The 21st century, also known as the digital age, is an era in which technology has the potential to influence the education system, including the learning process (Gestiardi, 2021). Technology-based learning is nothing new. In addition, there have been changes in the learning process. Work systems have shifted from manual (conventional) to IT-based (or digital) (Kristiawan, 2019).

The use of media in the teaching-learning process is viewed merely as teaching aids, such as pictures, models, objects, and other tools. This helps provide a specific learning experience, motivates students to learn, and improves their ability to absorb and retain information. However, because they are too focused on the teaching materials used by teachers, they rarely pay attention to instructional design, production, development, and evaluation.

Effective use of educational media can stimulate and enhance students' motivation and creativity, which serve as benchmarks for a high-quality teacher. For this reason, teachers must stay informed and keep up with technological advancements so they can create their own educational materials. Teachers should therefore understand the relationship between media, learning, and technology. This will make teaching and learning more effective and save time. For example, PowerPoint presentations can make learning more practical and allow students to learn anytime and anywhere. There are many apps that support learning activities. One app that teachers can easily use to create PowerPoint presentations is Canva.

Canva is an app that offers a convenient alternative for design work. One of Canva's key advantages is that it makes it easy to create any kind of design—including presentations (PowerPoint), graphics, ebook covers, and videos—using built-in animations, and publish them directly anywhere.

Based on these issues, the researcher conducted observations and found that there were problems in the learning process at Junior High School 12 Satap Tibawa. This is evidenced by several issues related to the suboptimal use of technology-based media, learning resources that rely solely on government-provided textbooks, and the underutilization of learning models. The use of interactive media is still very rare in the learning process, especially when it comes to understanding mathematical concepts.

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Given the various challenges faced at Junior High School 12 Satap Tibawa, the researcher was motivated to conduct research and development (R&D) using interactive learning materials based on Canva. One way to leverage advanced technology in education is through educational media that can help students understand the Pythagorean theorem, specifically the Canva-Based Interactive Learning Media. This media is expected to spark students' interest in learning by creating a fresh and more engaging atmosphere through the integration of various elements. Given the background of the issue described above, the researcher is interested in conducting a study titled "Development of Interactive Media Based on the Canva Application for the Pythagorean Theorem Curriculum in Grade 8 at Junior High School 12 Satap Tibawa."

METHOD

The research procedure for device development uses the 4D (four-D) model by Sivasailam Thiagarajan, Dorothy S. Semmel, and Melyn I. Semmel. The 4D development model was chosen because it is more systematic and suitable for developing instructional materials. These materials utilize PowerPoint-based designs created with Canva. From the use of PowerPoint-based Canva templates, which were subsequently developed into interactive PowerPoint-based learning materials. But in this study, the 4-D (four-D) model—define, design, develop, and disseminate—was modified into a 3-D (three-D) model: define, design, and develop.

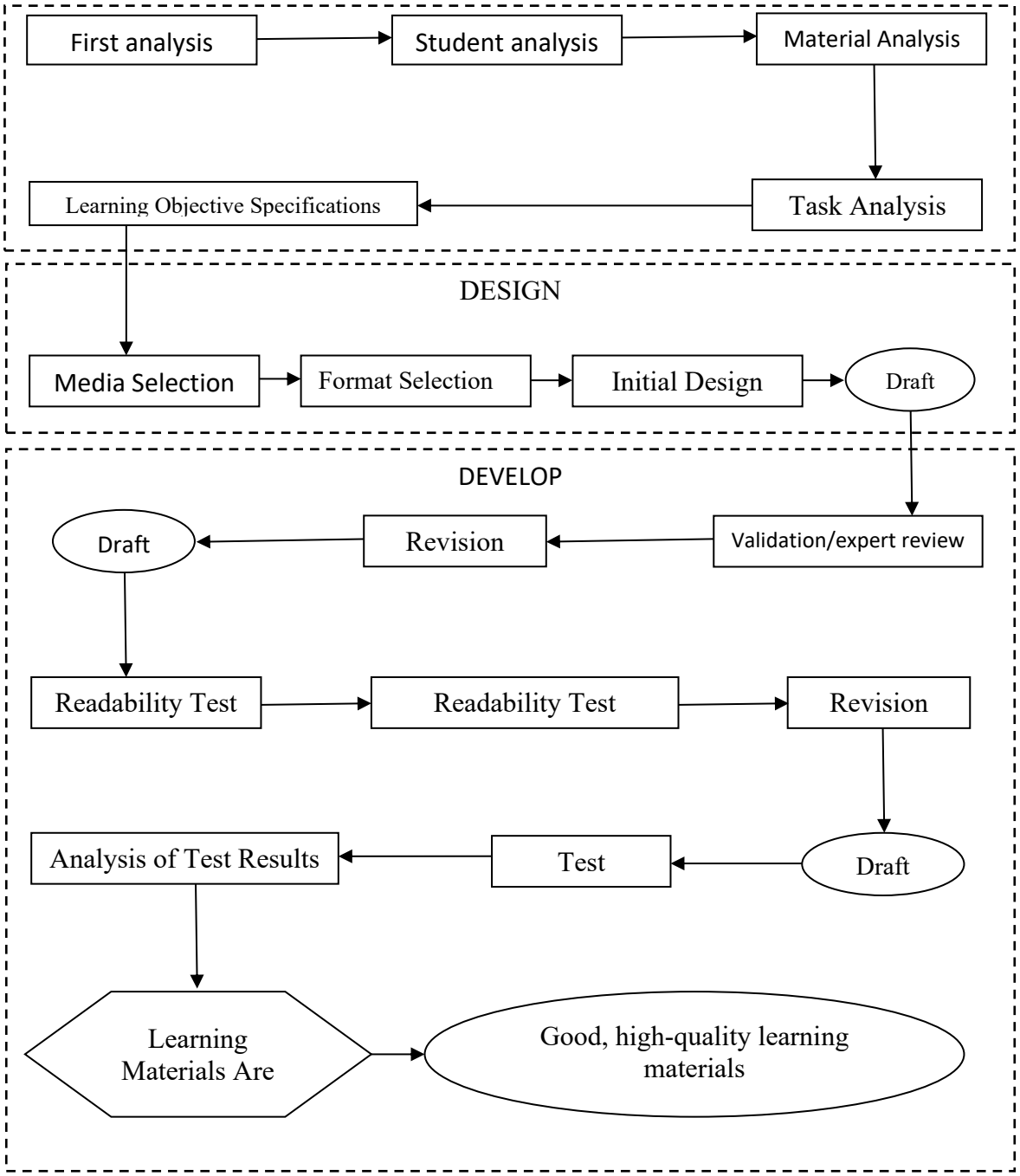
a. Simplification of the model from four phases to three phases: definition, design, and development.
b. The concept analysis and task analysis, which were originally conducted in parallel, were reorganized into a sequential process, moving from concept analysis to task analysis.
c. The term "concept analysis" has been replaced with "content analysis."
d. Readability testing was conducted during the development phase

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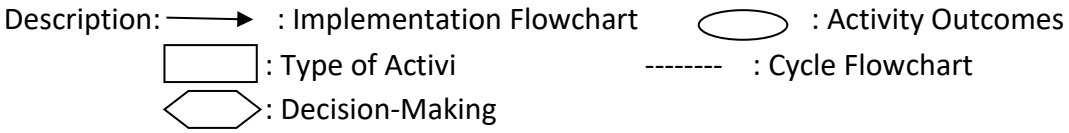


Image 1. Modification of the Interactive Learning Media Development Model

a. Type of Data

The data used in this study is quantitative data. The data collected pertains to the instructional media developed—specifically, interactive instructional media using PowerPoint (PPT) for the Pythagorean theorem—based on evaluations by subject matter experts, media experts, and student feedback.

b. Data Collection Methods

This study on the development of interactive learning media using PowerPoint (PPT) employs four types of data collection methods: observation, interviews, questionnaires, and documentation.

a) Observation
b) Interviews
c) Questionnaires
d) Documentation

c. Data Analysis Techniques

a. Analysis of Expert Validity Test Results

$$\text{Validity Score} = \frac{average\ score}{maximum\ score}\ x\ 100\ \%$$

b. Analysis of the Results of the Feasibility Test

$$\text{Level of Practicality} = \frac{skor\ rata{-}rata}{skor\ maksimum}\ x\ 100\ \%$$

RESULTS AND DISCUSSION

Result

Development of Mathematics Instructional Materials

The interactive mathematics learning media developed in this study was created using PowerPoint to teach the Pythagorean theorem to seventh-grade students at Junior High School 12 Satap Tibawa. The research subjects were seventh-grade students at Junior High School 12 Satap Tibawa in Gorontalo Regency during the first semester of the 2025/2026 academic year.

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$$\text{Tingkat Validitas} = \frac{skor\ rata{-}rata}{skor\ maksimum}\ x\ 100\ \%$$

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This study employed the 4-D model, consisting of four stages: definition (define), design (design), development (develop), and dissemination (disseminate). This study consisted of three phases: definition, design, and development. The dissemination (disseminate) stage was not carried out by the researcher due to time constraints; specifically, the dissemination (disseminate) stage requires conducting more than one pilot test with different research subjects, whereas the researcher only conducted a single pilot test. Furthermore, the objectives of this study were achieved in the third stage, namely development (develop). Therefore, this stage was not carried out.

The objective of this study is to develop interactive learning media that meet criteria for validity and practicality. The validity of the interactive learning media was assessed based on the results of a media validity evaluation conducted by two media experts and two subject matter experts. The practicality of the interactive learning media was assessed based on the responses of one mathematics teacher and 19 students from Junior High School 12 Satap Tibawa regarding the use of the media in the classroom.

Description of the Development Stages and Results of the Development of Interactive Learning Media

Definition Phase (Define)

In this analysis phase, the researcher used the interview guidelines provided in Appendix 1. The following are the results of the analysis:

a) Beginning-End Analysis
b) Learner Analysis
c) Concept Analysis
d) Task Analysis
e) Learning Objective Specifications

Design Phase

This phase aims to create an initial product design using PowerPoint. By focusing on PowerPoint and utilizing the Canva application as a supplementary tool, a framework for the developed instructional media was established. Canva is a website for sourcing and editing images, while iSpring Suite 10 is instructional design software supported by quiz content, enabling direct interaction during learning (Yantu et al., 2024). This phase consists of three steps in the design process, namely:

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a) Results of the Media Selection

The instructional media required for teaching the Pythagorean Theorem to eighth-grade students at SMP Negeri 12 Satap Tibawa were selected based on an analysis of the subject matter, task analysis, and learning objectives. Based on the results of this analysis, it was determined that the most suitable learning media for teaching the Pythagorean Theorem are interactive tools that can capture students' attention. Meanwhile, the equipment required during the learning process includes laptops/computers, speakers, an LCD projector, and cell phones.

b) Results of the Format Selection

The selection of media formats is intended to design or develop instructional media content tailored to the learning materials and the 2013 curriculum in use. The selected media development format is a concept that can encompass all learning objectives of the Pythagorean theorem material, consisting of basic concepts and theorem statements, the Pythagorean formula, Pythagorean triples, the converse of the Pythagorean theorem, applications in plane and solid geometry, and comparisons of the sides of special triangles, as well as contextual problem-solving included in the media to facilitate the learning process for students.

Here are the results of the format selection:

Appreciation Page



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Page on the Pythagorean Theorem



The Pythagorean Theorem Properties Page



Right Triangle Identification Page



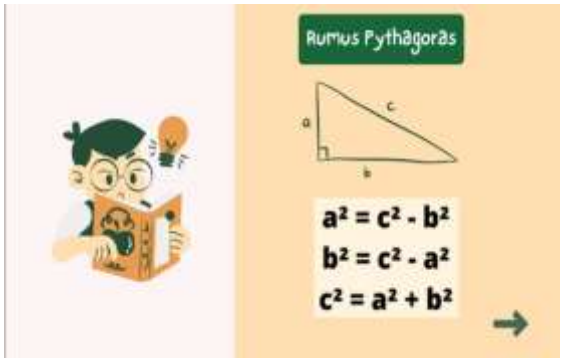
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Pythagorean Theorem Page



Preliminary Design Results

The results of the preliminary design include the design of the media used to obtain the data needed for the development process. The media design is based on the results of the analysis conducted during the definition phase and other earlier phases of this design process. This phase will produce an initial product that will then be developed in the development phase. These design results are referred to as Draft I.

The following are the results of the initial design of the interactive learning media for the Pythagorean theorem.

Opening Page



Home Page

This section serves as an introduction to the media, featuring background music designed to help students focus their attention on the material to be studied. Before beginning the learning activity, students or users can select a learning menu from the media.

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Help Page



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Content Page

The content section covers the Pythagorean theorem, including explanations of the definition of the Pythagorean theorem, its properties, how to identify right triangles, and the Pythagorean theorem formula. This section also includes illustrations, background music, and voiceovers for each topic.





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Practice Questions Page

The Practice Questions section contains 15 multiple-choice questions of varying difficulty levels. Answers are provided immediately after you complete the questions:



Development Stage

This stage produces the final version of the interactive learning media on the Pythagorean theorem, which has been revised based on feedback from experts and data obtained from readability tests and limited trials of the Pythagorean theorem material. Validation is conducted after the design stage, during which the interactive learning media is evaluated by experts acting as validators. This evaluation focused on two main aspects: content and media. The results of this validation process consisted of corrections and suggestions from the validators, which served as guidelines for revising and refining the Interactive Learning Media. The revisions made after receiving this feedback and deemed valid by the validators are referred to as Draft II.

a) Validators

The validators implementing the validation of the Interactive Learning Media to be developed (Draft II) consist of three validators: two Mathematics Lecturers at Universitas Negeri Gorontalo and one Mathematics Teacher at Junior High School 12 Satap Tibawa.

b) Validator Findings and Revisions to the Interactive Learning Media

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Media Experts

The analysis of observation data from the media expert can be found in Appendix ?. The validation results yielded a total validity percentage of 88.88%. According to findings by Yantu et al. (2024), the average validity score for the media reached 87%.

Media Revisions

In the previous stage, several suggestions for improvement were received from the validators.

Table of Design Revision Results

Before the update	After the update
The source of the material must be cited, whether it is a personal source or an online source 	The source of the material has been cited 
The video has been framed 	The video has already been framed 

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The underline in the cropped text has been removed



Check the hyperlinks on each slide again



The hyperlinks have been updated on every slide



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Validation Results and Material Revisions

Subject Matter Experts

The analysis of data from the subject matter experts' observations can be found in Appendix 8. The validation results yielded a total validity percentage of 82.63%. There is a slight difference from the findings of Yantu et al. (2024), who reported that the material validation results achieved an average score of 87%.

Material Revision

In the previous stage, several suggestions for improvement were received from the validators. Subsequently, revisions were made to the developed material. The results of these revisions form the basis of Draft II and have been pilot-tested.

Table of Revised Content

Before revision	After revision
Learning objectives are tailored to the material, in accordance with the stages of the statement 	The objectives have been aligned with the stages of the statement 

The operational verbs (KKO) used must be clearly in accordance with the rules of the Indonesian language so that students can understand the material being presented.



The operational verbs (KKO) used must be clearly aligned with the rules of the Indonesian language so that students can understand the material being presented.

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Product Pilot Test

In this section, the study conducted a limited product development pilot test in the 8th-grade class at SMP Negeri 12 Satap Tibawa, involving 20 students as detailed in Appendix 9. In this pilot test, the researcher presented the product—a PowerPoint presentation created using the Canva application—and explained the material and quiz-style questions. After the media was tested, the researcher distributed a questionnaire at the end of the learning activity to collect students' responses regarding the Interactive Learning Media related to the Pythagorean Theorem. The aim was to assess whether the media used was practical or not. The analysis results showed that student response to the development trial reached 91.94%, indicating that the media used met the criteria for being highly practical. Teacher evaluations also yielded positive results, with survey scores reaching 82.14%. Thus, the developed media met the practicality criteria and was deemed highly practical. The results of the pilot test are presented in Appendices 10 and 11. Since no revisions were made at this stage, Draft III was designated as the final draft.

DISCUSSION

Mathematical connections are crucial in mathematics. These connections help build students' mathematical understanding, enabling them to solve mathematical problems. The ability to make mathematical connections occurs when a person thinks about a mathematical problem and considers how to solve it using ideas or concepts they have previously learned. Therefore, students need to be trained in this ability. If students can relate or connect ideas in mathematics, their understanding will be deeper and more enduring because they will be able to see and understand the connections between mathematical topics, with other fields, or with experiences or problems commonly encountered in daily life (Yusuf et al., 2022). The product of this research is an interactive learning resource using PowerPoint based on the Canva application for teaching the Pythagorean theorem. The development process of this interactive learning media was based on the 4D model (Define, Design, Develop, Disseminate), although in this study, it only reached the Develop stage. Sukmadinata (2010:164) explains that research and

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development (R&D) is a strategy or research method that is quite effective for improving practice. It is further explained that research and development is a process or a series of steps to develop a new product or improve an existing one in a accountable manner; this is the basis for selecting the 4D model in media development so that it can produce a valid and practical learning media product.

The advantage of interactive learning media lies in its ability to encourage students to learn actively. Findings by Rivai et al. (2025) indicate that learning models combined with interactive media tools such as Canva significantly improve students' understanding and mastery of mathematical concepts related to data presentation. This media provides students with opportunities to construct their understanding both independently and in groups. Furthermore, the use of interactive learning media makes the learning process more engaging by connecting mathematical concepts to students' real-life contexts, thereby bringing them into touch with practical, everyday knowledge. Consequently, students can see the relevance and benefits of learning mathematics, ensuring that classroom instruction remains closely connected to their daily lives.

RESEARCH LIMITATIONS

a) Due to time constraints, this study was conducted in only one class of 20 eighth-grade students at Junior High School 12 Satap Tibawa.
b) The pilot test was not conducted in a laboratory but in a classroom, where each group had one laptop.
c) The development of the learning media only reached the pilot test or development stage and did not proceed to the dissemination stage due to time constraints.

CONCLUSION

The results of the development of the Canva-Based Interactive Learning Media for the Pythagorean Theorem in Grade 8 at SMP Negeri 12 Satap Tibawa fall into the "very good" category and can be used in instruction. The students' response to the Canva-Based Interactive Learning Media on the Pythagorean Theorem for 8th Grade at SMP Negeri 12 Satap Tibawa in the learning process was very good, meeting the criteria of being highly practical.

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variabel di kelas X SMK Yabri Terpadu Pekanbaru. *AKSIOMATIK: Jurnal Penelitian Pendidikan dan Pembelajaran Matematika*, *7*(1), 35-40. https://journal.uir.ac.id/index.php/AKS/article/view/2389

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