

## Multimedia-Based Geometry Education for Elementary School Students

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Article Info	ABSTRACT
<p><b>Corresponding Author:</b> Hari Suryantoro E-mail: <a href="mailto:h.suryantoro@swadharma.ac.id">h.suryantoro@swadharma.ac.id</a></p>	<p>This study is concerned with the creation of interactive multimedia for elementary school geometry instruction in an effort to enhance students' comprehension. Considering the criticality of technology integration in the realm of education, interactive multimedia presents a novel and efficacious approach to imparting academic content. Interactive multimedia, comprising video, text, images, sound, animation, and animation, enables students to comprehend and visualize geometric concepts in a real-world setting, thereby promoting active and interactive learning. As technology progresses, interactive multimedia becomes increasingly affordable and accessible, facilitating both independent learning and online teacher-student interaction. This research develops and implements interactive multimedia using the ADDIE model, beginning with a requirements assessment and concluding with an implementation evaluation. The findings indicate that the incorporation of interactive multimedia can increase students' comprehension and interest in geometry, as well as enrich the learning experience.</p> <p><b>Keywords:</b> Interactive Multimedia Learning, ADDIE Model Digital Learning, Flash Flayer Software</p>

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### INTRODUCTION

The integration of technology in education facilitates the acquisition of information and enhances the learning process for both teachers and pupils (Fauzi et al., 2023). Interactive multimedia is a highly beneficial technology within the realm of education. Interactive multimedia encompasses a diverse array of media elements, including textual content, visual imagery, auditory elements, animated elements, and video footage. Interactive multimedia enables students to engage in a more dynamic and participatory learning experience. Students have the opportunity to observe the practical application of the subject matter in real-life scenarios and mentally conceptualize it. Furthermore, interactive multimedia facilitates students' comprehension of the subject matter and enhances their ability to retain it. Advancements in interactive multimedia technology enable professors and students to engage and acquire knowledge through online platforms. Students have the ability to retrieve course materials at any time and from any location, while

teachers can oversee student advancement and offer suitable criticism (Handayani et al., 2021; Pudjiarti et al., 2022; Rony et al., 2023). Furthermore, advancements in technology have facilitated the increased accessibility and affordability of interactive multimedia for a wider range of individuals. Cloud computing technology enables convenient access to learning apps for both students and teachers. These programs are designed to be user-friendly and aligned with the learning syllabus (Rony, 2019; Sudipa et al., 2022).

Interactive multimedia encompasses a diverse array of media elements, including textual content, visual imagery, auditory elements, animated elements, and video footage. The utilization of interactive multimedia enhances the enjoyment and engagement of elementary school students in the process of learning geometry (Puspitarini & Hanif, 2019). Students can acquire knowledge in a more dynamic and engaging manner, facilitating their comprehension of geometric concepts. The utilization of interactive multimedia enables youngsters to observe the practical application of geometric forms in their daily lives. The utilization of visual and interactive methods enables students to acquire knowledge of diverse geometric shapes, hence facilitating comprehension and retention of the subject matter (Yuniara, 2022). Interactive multimedia has the potential to facilitate children's comprehension of geometric shapes and their practical applications in real-world scenarios (Udayana et al., 2022; Werdiningsih & Nursanty, 2021).

Based on the completed literature review, the objective of this study is to provide interactive multimedia materials for geometry education. The purpose is to enhance children's comprehension of geometry concepts and foster greater student engagement in the learning process. This interactive multimedia can serve as a viable solution for teachers seeking to enhance children's comprehension of geometry and facilitate the learning process for primary school students.

## **METHOD**

A development technique known as ADDIE (Ranuharja et al., 2021; Rony, 2017) was utilized in the process of creating an interactive multimedia learning geometry curriculum for primary school students. The ability of this model to apply the level of design and development of learning materials has been realized in numerous methodological practices for the design of text development, audiovisual materials, and computer-based learning materials (Arifin et al., 2023; Irawan & Windarti, 2023). This model is considered to be one of the systematic learning design models as it can apply this level of design and development. When it comes to the exploitation of interactive multimedia in order to assist the growth of student knowledge and the attainment of learning objectives, the ADDIE model is quite helpful. There are five stages that make up this ADDIE model (Spatioti et al., 2022), and they are as follows: analyze, design, develop, implement, and evaluate their results.

## **RESULTS AND DISCUSSION**

### **MultiMedia Flow Analysis and Design Stage**

During the analysis phase, it is evident that there are issues concerning students' comprehension of geometry concepts in elementary school, particularly in identifying the

objects within a building space. This is because in order to effectively visualize the geometry of a building space, it is necessary to use media that can clearly depict the shape of the space being studied. The initial stage of the design process involves the creation of a menu flow for interactive multimedia. This menu flow serves to assist users in navigating around the media effectively. Figure 1 below illustrates the menu flow.

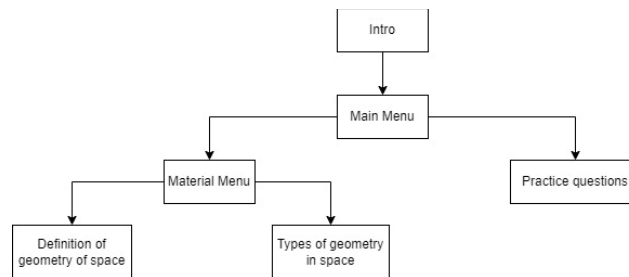


Figure 1. Geometry Interactive Multimedia Menu Flow

According to Figure 1, the flow of the multimedia menu can be defined as follows: there is an intro button that serves as the initial flash screen of the media; after pressing the start button, there will be a main menu and an exercise questions menu. There are items on the primary menu that pertain to the concept of geometry, particularly those that pertain to space and the various types of geometry. Students can use the practice questions menu to evaluate their level of comprehension after studying the geometry material that is located on the material menu. These practice questions can be found on the practice questions menu.

### Graphic Asset Creation Stage

Both the title and the graphic assets that were being created became significant components during the process. The vector design method that was used to create the business card was an accurate and scalable one, and it was produced using Adobe Illustrator. The letters were given the option to have artistic touches added to them through the application of creative effects using Adobe Photoshop. These effects included shadow effects and light effects. The utilization of these two programs was highly beneficial in the process of producing a graphic design that was both appealing and professional.

### Media Realization Stage

Adobe Flash Player is the software that is utilized in the process of implementing the media. This is done so that it is able to generate assets and movement animations that are associated with learning geometry. This helps to facilitate the process of supplying information from learning materials.

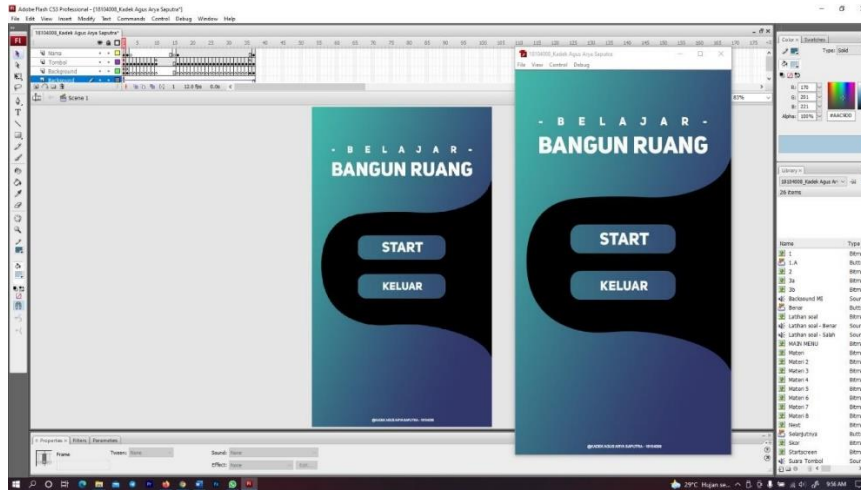


Figure 2. Media Creation Stage

Each piece of educational content is developed using Adobe Flash in order to ensure that it can be tested in accordance with the media menu flow that has been established. The media contains content that is derived from a variety of geometric forms.

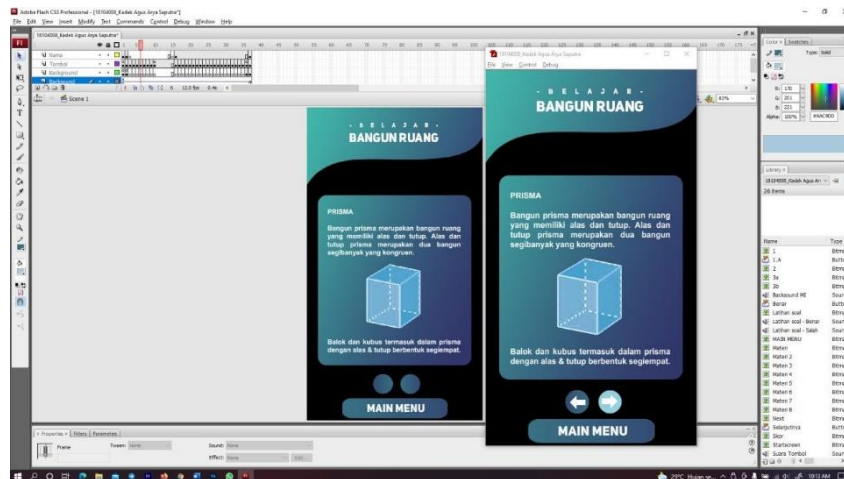


Figure 3. Learning Material Creation Stage

## Production Stage

Following the completion of the editing process stage, the next significant step in the post-production process is the rendering of the media in the flash player format. Following the completion of these procedures, the media is now prepared to be disseminated and posted to web platforms as digital learning media related to geometry elements that are used in fundamental schools.



Figure 4. Geometry Learning Media Display

## CONCLUSION

The creation of interactive multimedia for the purpose of teaching geometry in primary schools has the potential to significantly improve students' comprehension as well as their sense of interest in the subject. With its capacity to incorporate a wide range of different types of material, interactive multimedia offers a wealth of opportunities for learning in a manner that is both more participatory and more interesting. The ADDIE model serves as the foundation for its development process, which guarantees that learning materials are produced in a methodical manner, that they cater to the requirements of the students, and that they are in line with the learning goals. The findings indicate that the utilization of interactive multimedia not only enhances students' comprehension of the fundamentals of geometry but also inspires them to take a more active role in the process of learning those concepts. The argument for incorporating interactive multimedia into the teaching of geometry is further strengthened by the fact that digital technology provides a flexible learning environment and makes it easier to acquire materials. As a result, interactive multimedia can be regarded as an efficient and interesting educational tool for elementary school pupils, assisting them in overcoming difficulties in comprehending geometry.

## REFERENCES

- Arifin, A., Mashuri, M. T., Lestari, N. C., Satria, E., & Dewantara, R. (2023). Application of Interactive Learning Games in Stimulating Knowledge About Object Recognition in Early Childhood. *Educenter: Jurnal Ilmiah Pendidikan*, 2(1).
- Fauzi, A. A., Kom, S., Kom, M., Budi Harto, S. E., MM, P. I. A., Mulyanto, M. E., Dulame, I. M., Pramuditha, P., Sudipa, I. G. I., & Kom, S. (2023). *PEMANFAATAN TEKNOLOGI INFORMASI DI BERBAGAI SEKTOR PADA MASA SOCIETY 5.0*. PT. Sonpedia Publishing Indonesia.
- Handayani, E. S., Hikmah, N., & Astuti, N. K. (2021). ANALISIS PENERAPAN MODEL

- PEMBELAJARAN MAKE A MATCH OLEH GURU KELAS II SDN 015 SUNGAI PINANG. *Jurnal Inovasi Penelitian*, 2(5), 1485–1490.
- Irawan, D., & Windarti, Y. (2023). The case of character education implementation in elementary schools: How are promotions and its problems? *International Journal of Education, Vocational and Social Science*, 2(01), 196–208.
- Pudjiarti, E., Lisdiyono, E., & Werdiningsih, R. (2022). Knowledge management to develop comprehensive networking of university-industry collaboration in technology and innovation performance. *International Journal of Data and Network Science*, 6(2), 461–468.
- Puspitarini, Y. D., & Hanif, M. (2019). Using Learning Media to Increase Learning Motivation in Elementary School. *Anatolian Journal of Education*, 4(2), 53–60.
- Ranuharja, F., Ganefri, G., Fajri, B. R., Prasetya, F., & Samala, A. D. (2021). Development of interactive learning media edugame using ADDIE model. *Jurnal Teknologi Informasi Dan Pendidikan*, 14(1), 53–59.
- Rony, Z. T. (2017). Siap fokus, siap menulis skripsi. In *Tesis, Disertasi (Jurusan Mudah Gunakan Metode Kualitatif Tipe Studi Kasus)* (Vol. 29). Pertama). PSSDM. [http://repository.ubharajaya.ac.id/9973/1/02\\_Siap\\_Fokus\\_...](http://repository.ubharajaya.ac.id/9973/1/02_Siap_Fokus_...)
- Rony, Z. T. (2019). Generation y challenges in becoming innovative leaders at organization in the 21st century. *International Journal of Recent Technology and Engineering (IJRTE)*, 8(Issue-), 789–794.
- Rony, Z. T., Mangkupradja, D. R., & Pramukty, R. (2023). THE ROLE OF TRANSFORMATIONAL LEADERSHIP IN EMPLOYEE PERFORMANCE: A SYSTEMATIC LITERATURE REVIEW AT XYZ UNIVERSITY. *International Journal of Accounting, Management, Economics and Social Sciences (IJAMESC)*, 1(4), 331–342.
- Spatioti, A. G., Kazanidis, I., & Pange, J. (2022). A comparative study of the ADDIE instructional design model in distance education. *Information*, 13(9), 402.
- Sudipa, I. G. I., Aditama, P. W., & Yanti, C. P. (2022). Developing Augmented Reality Lontar Prasi Bali as an E-learning Material to Preserve Balinese Culture. *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications (JoWUA)*, 13(4), 169–181. <https://doi.org/http://doi.org/10.58346/JOWUA.2022.I4.011>
- Udayana, I. P. A. E. D., Kherismawati, N. P. E., & Sudipa, I. G. I. (2022). Detection of Student Drowsiness Using Ensemble Regression Trees in Online Learning During a COVID-19 Pandemic. *Telematika: Jurnal Informatika Dan Teknologi Informasi*, 19(2), 229–244.
- Werdiningsih, R., & Nursanty, E. (2021). Agility, Innovations & Prospects-Virtual Pedagogy During Physical Distancing. *International Conference on Engineering, Technology and Social Science (ICONETOS 2020)*, 80–86.
- Yuniara, R. (2022). Peningkatan Kualitas Siswa SD, SMP, SMA melalui Kursus Mata Pelajaran Matematika. *Biram Samtani Sains*, 6(2).