



## The Effectiveness of Audio-Visual Based Learning Media Assisted by Adobe Software in Physics Learning

Elfira Josmin Filimditty , Alvama Pattiserlihun, Wahyu Hari Kristiyanto

Universitas Kristen Satyawacana Salatiga

Jl. Diponegoro no 52-60, Salatiga, Jawa Tengah, Indonesia

| [192015012@student.uksw.edu](mailto:192015012@student.uksw.edu)  | DOI: <https://doi.org/10.37729/radiasi.v16i2.1709> |

### Abstract

*As science and technology advance, reform efforts in the utilization of technological outcomes in the learning process become more common. The goal of this study was to determine the efficacy of developing Audio-Visual-based Physics learning medium for use in Physics classes. ADDIE is the method that was used (Analyze, Design, Development, Implementation, Evaluation). Analyze (analyze) the contents of determining the test subject, the program that will be used to create films, and the reference material that will be collected. The content is designed (development). Making films, adjusting the data collection instrument to the aspects to be examined Storyboard (story sequence + visuals) as a physics learning medium produced based on the results of earlier analysis, Implementation (implementation) displays the contents on the subject using the Zoom meeting application. Development (development) includes product realization and validation for material specialists and media experts. Observation (evaluation) Data is gathered using data collecting instruments such as a questionnaire sheet for one material expert and one media expert, as well as answer questionnaires for 15 early-level SWCU Physics and Physics Education students on nuclear material, with a 75 percent affirmative response rate hypothesis. Data analysis that has been descriptively, qualitatively, and quantitatively processed. The results of a questionnaire to material and media experts were 94.17 percent, and the results of the questionnaire responses found 93.68 percent of all aspects, with the majority of the subjects stating that the audio-visual-based physics learning media that was created was worthy of being used as learning media.*

### Article Info:

Received:  
02/12/2021

Revised:  
27/04/2023

Accepted:  
03/05/2023

**Keywords:** Learning, Media, Audio, Visual, Physics, Adobe



## 1. Introduction

Today, science and technology development is extremely rapid and inescapable, resulting in the use of science and technology controlling practically all human activities. With the advancement of science and technology, it is necessary to make an effort to make these fields more accessible [1]. "Learning is a process of interaction between students and educators, as well as learning resources in a learning environment," stated Article 1 paragraph 20 of RI Law No. 20 of 2003. Students are expected to be more active in seeking and obtaining information in today's education because it promotes independence in the learning process. Educators are no longer solely responsible for disseminating information; instead, they have evolved into facilitators who design the learning process in the classroom, necessitating the creation of educational facilities that can facilitate the implementation of an effective teaching and learning process [2], [3].

The teacher's methods, learning material, the teacher's behavior, and the teacher's appearance in the classroom are all factors that influence students' interest in learning. The importance of learning media offered to students will be highlighted in this study in order to increase student enthusiasm in learning. Students' attention will be piqued by a wide range of learning media that may be customized to the timings and needs of students [4]. Although educators are the primary mediators in classroom learning, tools or other media are also required in order for learning to be more dynamic and attain the intended outcomes. Well-packaged learning media may make the learning process more exciting and appealing to pupils [5], [6]. As science and technology advance, reform efforts in the utilization of technological outcomes in the learning process become more common. To achieve the intended educational goals, educators must be able to use and develop media that has been offered in schools or media that is in conformity with current developments and expectations. Teachers must be able to build abilities in creating learning media that will be used in the learning process in addition to being able to use these media [7].

Learning media can improve learning motivation, stimulation, and comprehension of material provided to pupils, as well as have psychological effects on them [8], [9]. The advantages of using audio-visual include: students can get the subject matter with the same and right perception. Educators can assist students focus on learning and remember material, making it easier to convey the knowledge and skills they've acquired [3], [10].

Physics is a branch of science, which is essentially a collection of facts, theories, and study. Facts, hypotheses, and models can all be found in physics as a body of knowledge. Physics as a method of thinking is an activity that takes place in the brains of people who are interested in natural occurrences and want to learn more about them [11], [12]. Because there involves movement of images and sounds, animation media also encompasses audio visual media. Learning media in the form of animation in Physics subjects is a media that contains a collection of images that are processed in such a way that it produces movement and is equipped with audio so that it is memorable to live and saves learning messages related to Physics subjects. provide educational materials [13].

The research question is: how effective are audio-visual based physics learning resources for physics education? This study's advantages include providing alternate learning medium for both teachers and students, as well as audio-visual learning. The goal of this research is to determine how effective the production of audio-visual based physics learning media is for physics learning.

## **2. Methods**

Research and development is the term for this type of study. The ADDIE approach is used in the learning media development method (Analyze, Design, Development, Implementatiton, Evaluation). The first phase of this research (Analysis) identifies several factors that contribute to students' lack of interest in Physics lessons, the need for an engaging audio-visual-based learning media to encourage students to learn Physics, the selection of test subjects, the applications that will be used in making videos, and the gathering of atomic references. Stage 1: Design During the design stage, storyboards (context + picture sequences) are created as a Physics learning medium based on the findings of the preceding study, and references about atoms in learning are sought from a variety of textbook sources utilized by educators (teachers). Following the collection of all resources, a design is created as shown Figure 1.

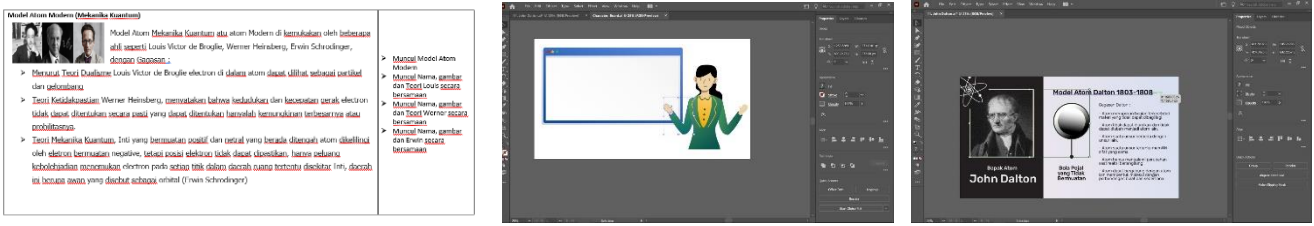


Figure 1. Image of a Story Board

After creating vectors with Adobe Illustrator, animating films with Adobe After Effects, and creating the following Figure 2. Then, using Adobe Premiere software and photos, edit the film so that it can run on Windows and Mac IOS platforms.

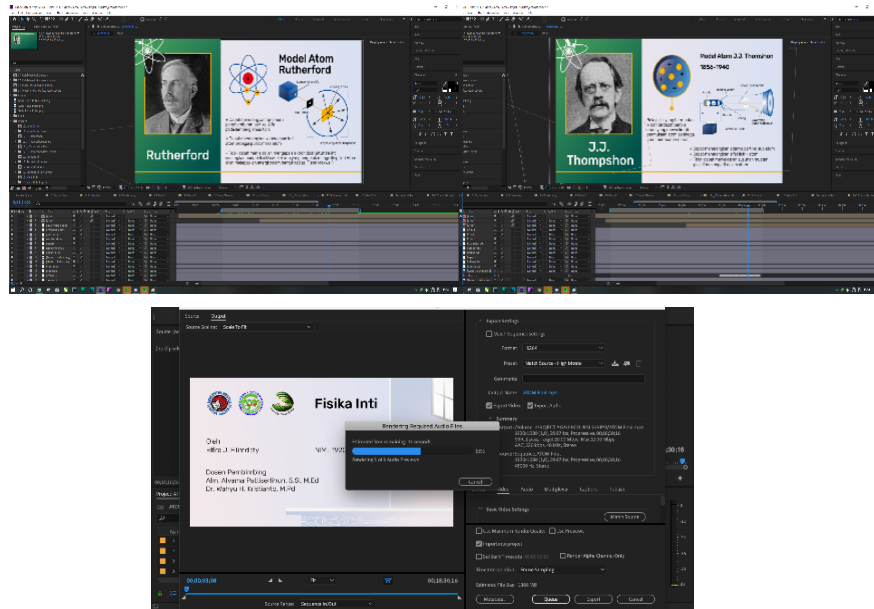


Figure 2. Images of Animated Video Creation and Image Video Editing

At this point, the researcher also created an instrument that would be used to evaluate the audio-visual (video) media that had been made. The instruments are created with the following features of media evaluation in mind: aspects. How many validation sheets (open the assessment) media and subsequent response questionnaires have been prepared are among the instruments that have been compiled. To create a valid assessment instrument, the instruments that have been compiled will be validated.

Development is the stage of product realization during which audio-visual media is developed in accordance with the design, following which the media (video) is certified by validators (media experts and material experts). The validator (media and material) employs an instrument that was developed in the previous stage in the validation process, pointing out that the statements and material in the video are in agreement with physics ideas based on the results of the material validation. After clearing the validation step by an expert validator, the goal of this stage is to build a learning media that has been developed and can be realized to the sample/ subject. The audio-visual (video) based learning media is feasible to use in the sample/subject with a little assistance offered by the expert validator, based on the validation carried out by the expert validator (media and materials).

The audio-visual (video) based learning media deployment phase is complete and ready to be disseminated to samples/ subjects. Physics students and SWCU FSM Physics education in the early stages/just graduated) were utilized as samples by the researchers. Before joining for about 45 minutes, the researcher introduces himself and the supervisor, and who will be shown to be followed / listened to, the sample also listens to what is displayed, and at the end of the sample video is explained about filling out the response questionnaire given, at the stage of the research. There are network issues in this implementation (errors during the explanation of filling out the response questionnaire, causing the researcher to abandon the Zoom meeting numerous times), but they may be resolved fast so that everything runs well.

At the evaluation stage, all of the information gathered will be analyzed using a qualitative descriptive technique. This research is regarded to be successful if more than 75% of the individuals react positively, according to the results of the questionnaire (response questionnaire). The researcher next completed a final revision of the audio-visual (Video)-based learning medium that had been created based on the responses to the questionnaire. It is planned that the media that is generated and suitably appropriate and can be utilized as a good learning media.

The data collecting instrument is a tool used to direct the data collection process. Media expert instruments, material expert instruments, and respondent instruments later were employed in this investigation. The data is then combined using a formula to produce the percentage of eligibility, which is then input into the score interpretation 81% - 100% is very deserving, 61% - 80%: worthy, 41% - 60%: quite adequate, 21% - 40%: less deserving, % - 20%: extremely unworthy.

### **3. Results and Discussion**

This research aims to see how effective audio-visual-based physics learning media can be when created with three Adobe apps and then verified by two experts (media and materials). The validation method entails giving media and media eligibility validation questionnaires for which an average value is desired. The results of the evaluation on the development of material and media physics material expert shows 88,33% in excellent category, and based on the assessment of media experts, the percentage validation result is 100% in the excellent category. Based on the assessment of the two experts, an average of 94.17% is obtained in the very good category and is suitable for use as a physics learning media. The average value of 94.17 percent falls into the very feasible category, and the media is pronounced very feasible to be tested or exhibited in front of the subject/sample with the suggestions stated.

This audio-visual media is used in physics learning in one meeting. The audio-visual media that is broadcast lasts approx. Following the display of the questionnaire, it was given to the subject/sample, namely Physics students and SWCU Physics education in the early stages, where the questionnaire was related to the media provided and filled in based on what was obtained from the media according to each respondent's opinion. The questionnaire consists of 14 statements written in a straightforward and concise manner, each with four possible responses. very good, good, enough, and poor. The results of the questionnaires that have been distributed to students obtained an average percentage of 93.68%. The details of the results for each item can be presented in [Table 1](#).

**Table 1.** Response Questionnaire Statements

| No.            | Statement   | Criteria |
|----------------|---|----------|
| 1.             | Image and animation settings on the media display's appropriateness   | 96,42%   |
| 2.             | The media fit of the accompanying music and narrator is obvious   | 86,60%   |
| 3.             | Matching font selection and text color  | 92,85%   |
| 4.             | Text and image color compatibility on the media   | 92,85%   |
| 5.             | The choice of terms in the film based on the students' degree of understanding  | 94,64%   |
| 6.             | This is a communicative language.   | 94,64%   |
| 7.             | The media display's compatibility for the required Physics competency standards   | 96,42%   |
| 8.             | The adequacy of the description of the media's presentation of material and concepts transmitted is relevant to students' requirements. | 92,85%   |
| 9.             | Animation is able to simplify complex objects   | 94,64%   |
| 10.            | Animation is capable of presenting pictures based on learning abilities   | 96,42%   |
| 11.            | According to the media's narration (material description), animation is created.  | 92,85%   |
| 12.            | The language used is standard.  | 96,42%   |
| 13.            | Sentences used and their effectiveness  | 91,07%   |
| 14.            | Information in the media that is given in language or sentences that is clear and complete.   | 92,85%   |
| Average of all |   | 93,68%   |

The average score of students who agreed with the entire statement was 93,68 % with a very good category, according to the results of the overall questionnaire recapitulation. As a result, this audiovisual-based learning media has been determined to be effective and can be used as an audiovisual-based interactive learning medium. These findings are in line with the results of research [14] which developed audio-visual media in physics learning to increase creativity and concept understanding in students. Audio-Visual assisted learning media can also be applied for distance or online learning, this is in line with the results of research [15], [16] that through audio-visual media physics learning becomes easier to understand and the concepts presented are easily accepted by students.

The utilization of Audio-Visual assisted learning media can also be applied to science learning conducted by [6] which presents the difference between science learning assisted by print and audio-visual media, the results of his research show an increase in student understanding of the material studied and an increase in student learning outcomes. Based on the research results and supported by previous studies, the utilization of learning media, especially Audio-Visual aids, is important to continue to be developed and applied in teaching. This is in line with [8], [17] that media as a messenger from teachers, teaching materials to students has a very important role.

The importance of using media in a class cannot be overstated. This is because the material delivered through the media will be clearer and easier to comprehend. Learning will take place successfully through the use of media, and the learning objectives will be met. Media has an important role in learning for both teachers and students. Through continuous development, media must always have novelty and innovation. This is in line with the opinion of [18] that there needs to be innovation in media utilization and development. Learning media can be applied to all learning models and methods, because media is a learning tool. This is in line with [9] opinion on improving students' abilities through audio-visual assisted media to support learning methods and models applied in the classroom.

## 4. Conclusion

Based on the results of the overall questionnaire recapitulation with a very good category with several suggestions that can be taken as notes, audio-visual-based physics learning media is effectively used to help understand Core Physics material in this case Atom, according to the research done using Adobe software. Following the findings of this study, it is suggested that additional researchers build audio-visual-based physics learning media, particularly for other physics topics, because these media offer the benefits of being able to picture abstract concepts while presenting them with sounds and images.

## References

- [1] K. Ratheeswari, "Information communication technology in education," *J. Appl. Adv. Res.*, vol. 3, no. 1, pp. 45–47, 2018.
- [2] C. Butcher, C. Davies, and M. Highton, *Designing learning: from module outline to effective teaching*. Routledge, 2019.
- [3] M. Hasan *et al.*, "Media Pembelajaran," 2021.
- [4] J. McDougall, M. Readman, and P. Wilkinson, "The uses of (digital) literacy," *Learn. Media Technol.*, vol. 43, no. 3, pp. 263–279, 2018.
- [5] M. Dhanil and F. Mufit, "Design and Validity of Interactive Multimedia Based on Cognitive Conflict on Static Fluid Using Adobe Animate CC 2019," *J. Penelit. Pengemb. Pendidik. Fis.*, vol. 7, no. 2, pp. 177–190, 2021.
- [6] F. Firdaus, "Efektivitas penggunaan media audio-visual dalam pembelajaran Sains," *SPEKTRA J. Kaji. Pendidik. Sains*, vol. 2, no. 1, pp. 46–54, 2016.
- [7] N. L. Andriyani and N. W. Suniasih, "Development of learning videos based on problem-solving characteristics of animals and their habitats contain in IPA subjects on 6th-grade," *J. Educ. Technol.*, vol. 5, no. 1, pp. 37–47, 2021.
- [8] D. M. Anggraeni and F. B. Sole, "E-Learning Moodle, Media Pembelajaran Fisika Abad 21," *J. Penelit. Dan Pengkaj. Ilmu Pendidik. E-Saintika*, vol. 1, no. 2, pp. 57–65, 2018.
- [9] C. Nicolaou, M. Matsiola, and G. Kalliris, "Technology-enhanced learning and teaching methodologies through audiovisual media," *Educ. Sci.*, vol. 9, no. 3, p. 196, 2019.
- [10] L. Mutia, G. Gimin, and M. Mahdum, "Development of blog-based audio visual learning media to improve student learning interests in money and banking topic," *J. Educ. Sci.*, vol. 4, no. 2, pp. 436–448, 2020.
- [11] M. Asriadi and E. Istiyono, "Exploration of Creative Thinking Skills of Students in Physics Learning," *J. Educ. Sci. Technol. EST*, vol. 6, no. 2, pp. 151–158, 2020.

- [12] L. Bao and K. Koenig, "Physics education research for 21 st century learning," *Discip. Interdiscip. Sci. Educ. Res.*, vol. 1, no. 1, pp. 1–12, 2019.
- [13] S. Aini and F. Mufit, "Using Adobe Animate CC Software in Designing Interactive Multimedia Based on Cognitive Conflict in Straight Motion," *J. Penelit. Pendidik. IPA*, vol. 8, no. 5, pp. 2350–2361, 2022.
- [14] F. P. Sari, S. H. Subroto, and F. Haroky, "Development of Audio-Visual Physics Animation Media to Improve Students' Understanding of Concepts and Creativity," *J. Penelit. Pengemb. Pendidik. Fis.*, vol. 8, no. 1, pp. 125–134, 2022.
- [15] A. S. Darmawan and W. A. Setyani, "Development of Audio Visual Media for Distance Learning," presented at the 6th International Seminar on Science Education (ISSE 2020), Atlantis Press, 2021, pp. 408–412.
- [16] W. B. Sulfemi, "Penggunaan Metode Demontrasi Dan Media Audio Visual Dalam Meningkatkan Hasil Belajar Peserta Didik Mata Pelajaran Ips," *Pendas Mahakam J. Pendidik. Dasar*, vol. 3, no. 2, pp. 151–158, 2018.
- [17] Z. Abidin, "Penerapan pemilihan media pembelajaran," *Edcomtech J. Kaji. Teknol. Pendidik.*, vol. 1, no. 1, pp. 9–20, 2017.
- [18] F. R. Rahim, S. Y. Sari, P. D. Sundari, F. Aulia, and N. Fauza, "Interactive design of physics learning media: The role of teachers and students in a teaching innovation," presented at the Journal of Physics: Conference Series, IOP Publishing, 2022, p. 012075.