IJSES 2(1) (2025)

International Journal of Science Education and Science

https://journals.balaipublikasi.id

Media Development Strategy Based on Audio Visual and Images in Improving Understanding of Soil Materials and Life Sustainability Concepts in Class IX

Kiki Rizki Maulia[1*], Aris Doyan[1], Mahrus[1]

[1] Master of Sciences Education Study Program, Pascasarjana University of Mataram, Mataram, Indonesia.

Received: August 28, 2023
Revised: November 7, 2024
Accepted: March 25, 2025
Published: March 31, 2025

Corresponding Author:
Kiki Rizki Maulia
kikirizkimaulia1@gmail.com

DOI: 10.56566/ijses.v2i1.51

© 2025 The Authors. This open access article is distributed under a (CC-BY License)

Abstract: Education plays a very important role in preparing quality human resources. The implementation of the independent curriculum encourages and challenges teachers to be creative in facilitating students to think critically, explore, be creative and experiment by utilizing various sources in the learning process. Researchers are interested in developing teaching materials in the form of teaching aids from used and practical materials for subsoil material and used as learning media in increasing students' conceptual understanding and also helping teachers in the learning process. This type of research is development. The development model used is the ADDIE model (props) and Lee and Owens (audio-visual media) with a 4-D model, namely define, design, develop, and disseminate. This media development strategy contains several characteristics, including (1) using Audio Visual media (2) containing sub-materials, videos, instructions and evaluation (3) facilitating students in developing students' thinking skills in a systematic, critical, logical, and analytical manner so that they can formulate their own learning conclusions with confidence; and (4) use language that is short, clear, easy to understand and understand, and uses supporting pictures related to land and the sustainability of life.

Keywords: Learning media; Life sustainability; Soil; Teaching aids

Introduction

The rapid development of science and technology as it is today demands the professionalism of teachers in educating their students. The role of teacher professionalism cannot be ignored in terms of forming insight, skills and intellectual maturity of students, because this is an important goal of education. For this reason, the achievement of an educational goal depends on how the learning and learning process is carried out professionally by educators. The teaching and learning process is the core of an educational activity in schools (Miranda et al., 2021; Pettersson, 2021). In the process of teaching and learning there is interaction between educators and students (Dini et al., 2023; Jamaluddin et al., 2024; Setianingrum et al., 2022).

Science is one of the subjects that aims to form insight, skills and scientific attitudes from an early age for students. These three aspects can only be obtained by giving direct experience through a series of scientific processes which include observing to drawing conclusions. Science teachers must have several characteristics in teaching including enthusiasm, high self-confidence, creativity, responsibility, good sense of humor and communication skills. Nahdi et al. (2018) explained that the teacher's role is very large in understanding the concept of learning in students. In addition, in teaching science, visual aids and learning

How to Cite:
Maulia, K. R., Doyan, A., & Mahrus, M. (2025). Media Development Strategy Based on Audio Visual and Images in Improving Understanding of Soil Materials and Life Sustainability Concepts in Class IX. *International Journal of Science Education and Science*, *2*(1), 12–16. https://doi.org/10.56566/ijses.v2i1.51

media are needed to attract students' interest, this is so that the learning process is more effective and efficient.

The Association for Education and Communication Technology (AECT), defines the word media as all forms and channels used to process information. The National Education Association (NEA) defines media as all objects that can be manipulated, seen, heard, read or discussed along with the instruments used for these activities. According to Hamalik (2003) states the use of teaching media in the teaching and learning process can generate new desires and interests, generate motivation and stimulate learning activities, and can even have a psychological influence on students. Nomleni et al. (2018) explain that the function of using learning media is to make it easier for students to understand abstract concepts, assist teachers in teaching and provide more real experiences.

One of the learning media used is audiovisual media. Riyanto et al. (2018) argue that audio-visual media is a tool in the form of sound impressions (audio) and images (visual) made in one play through various digital applications, besides that it is not entirely dependent on understanding words. In addition to audio-visual media, visual aids are one of the learning media that can help teachers and students achieve learning goals. Props play a major role in the success of a learning process. The use of visual aids must be done appropriately, as well as the selection of types that must be relevant to the educational material to be studied. The concept of learning requires two elements that are equally active, namely students and teachers, both of whom are reciprocally positioned as subjects-objects.

Teaching aids can also improve students' ability to understand material concepts because students can directly observe the processes that occur in them so as to improve learning outcomes. Learning outcomes are not only assessed from mastery of concepts but can be seen from the skills of the learning process. Nurhemy et al. (2011) also stated that science process skills are a teaching and learning process designed so that students can discover facts, concepts, and theories with their own process skills and students' own scientific attitudes. The reasons for using used materials and utilizing plants that exist in nature because they have advantages include (1) unique, (2) easy to obtain, (3) do not require a lot of money to get or cheap, (4) reduce waste accumulation, (5) students It will be easier to understand because they use the materials around them.

In the learning process, the teacher rarely uses props so that the learning process is only focused on the teacher and not prepared by the teacher. In the learning process, it is sometimes still abstract, so that students' ability to understand problems, solve problems, solve problems and re-examine the solutions given by the teacher has not been successful. This is because in the learning process of solving problems, the ability to understand concepts is required as a prerequisite and the ability to make connections between concepts and mental readiness.

The purpose of this research is to produce development products for audio-visual learning media (text, images, video, motion) and props made from used materials and are environmentally friendly on soil material and life sustainability in Integrated Science learning in improving concept understanding and problem solving and can be used as a medium or learning resource for students

Method

This type of research is Research and Development (R & D). The development model used is the ADDIE model (props) and Lee and Owens (audio-visual media). Lee et al. (2004) state that there are five stages of development as follows: (1) Assessment/analysis which consists of 2 main parts, namely needs analysis and front-end analysis; (2) Design (Design); (3) Development; (4) Implementation (Implementation); (5) Evaluation (Evaluation) as shown in Figure 1. However, this research was only carried out up to the Development stage. The implementation and evaluation stages have not been carried out because they are still in the review stage of the device with the technology readiness stage.

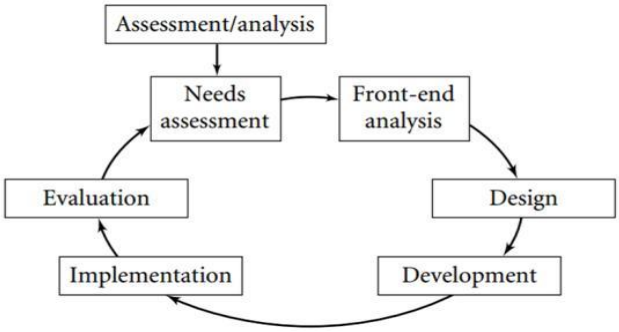

Figure 1. Multimedia development model

Data types are qualitative and quantitative descriptive data types Data collection Design techniques use questionnaires and tests to understand the concept. Data analysis techniques were calculated using the t test Pretest and Posttest two groups Design. For understanding the concept, while for data from validators and small and large group tests, data analysis was obtained through a questionnaire in the form of percentages. To test the research hypothesis for understanding the concept is calculated using the formula t test Pretest and Posttest two Group Design.

Table 1. Quality of Validation Questionnaire Assessment Scale

Evaluation Scale			
4	3	2	1
Appropriate	Just Appropriate	Less Appropriate	Not Appropriate
Clear	Quite Clear	unclear	unclear
Attractive	Quite Interesting	Less Attractive	Not Attractive
Easy	Quite Easy	Less Easy	Not Easy
Precise	Exactly Enough	Less Exact	Not Exactly

Table 2. Data Implementation Criteria

Range (%)	Qualification	Information
0-20	Very Not Good	Revision
21-40	Not Good	Revision
41-60	Faurly Good	Revision
61-80	Well	No Revision Needed
81-100	Very Good	No Revision Needed

Result and Discussion

A Conceptual Framework for the Organization of Modules

The results of this study are an audio-visual learning media product design, on the initial appearance there are instructions for use and in the instructions for use and for the next section there is a display of learning videos made by researchers, animations (moving images) and to support other activities in the form of teaching aids which is made from used materials and is environmentally friendly using surrounding plants which aims to strengthen students' understanding of soil material and the sustainability of life. The advantages of the media created are that it does not require internet access to use it.

This media is designed according to the material and provides convenience to the teacher in the learning and learning process. This research starts from the stage (1) Assessment/analysis where a needs analysis is carried out by looking for various scientific sources such as journal articles both national and international as well as books that are in accordance with the themes and titles discussed (2) carrying out the design starting from the material used and the media produced in videos and teaching aids then conduct a review, stage (3) carry out development which includes (making videos, making products in the form of teaching aids and audio-visual media, stage (4) implementation which is carried out through small group tests conducted on Study Program students Master of Science Education, Postgraduate University of Mataram in the subject of Essential Concept Analysis and Learning, totaling 20 students and 1 supporting lecturer to get suggestions in the development of learning media for the next.

Display of Learning Media

The following is an audio-visual display and props on soil material and the sustainability of class IX life.

Figure 2. Preliminary display of audiovisual media

Figure 3. Instructions for use

Figure 4. Video display

Figure 5. Quiz (guess the picture game)

Figure 6. Soil layer media

Conclusion

From the results of the development of learning media carried out and the results of observations from various scientific sources such as articles in both national and international journals and books, it can be concluded that learning using audio-visual media is more successful than learning without this media. The development of learning media aims to attract students' attention, foster learning motivation, be interactive, fun and students are directly involved in learning from the products being developed. The product received positive responses from other students and powerful lecturers and is suitable for use, although there are notes that must be considered to obtain perfect results. Learning media can be a vehicle for distributing learning messages and information. Learning media that is well designed will greatly assist students in digesting and understanding the subject matter. The function of the media in learning activities is not just a teaching aid for the teacher but rather as a carrier of learning information/messages. Each type of learning media has its characteristics, advantages and disadvantages. That is why there is a need for systematic planning for the use of learning media. Suggestions from the research: For Teachers: Be able to use simple but innovative media and visual aids so that teaching and learning activities become more effective, efficient and fun; For students: need to improve understanding of concepts and abilities and skills in solving problems; For other researchers: it is necessary to carry out broader follow-up research outside of research variables so that in the field of education it continues to develop so as to improve the quality of Indonesian education.

Acknowledgments
Thank you very much to those involved in writing this article, especially the lecturers in the Essential Science Concept Analysis course and its learning.

Author Contributions
For research articles with several authors, a short paragraph specifying their individual contributions must be provided.

Funding
This research received no external funding

Conflicts of Interest
The authors declare no conflict of interest

References

Dini, A., Rahmatan, H., Muhibbudin, Nurmaliah, C., & Safrida. (2023). Application of the E-module combined with the Guided Inquiry Learning Model to Increase Student Motivation and Learning Outcomes on the Structure and Function of Plant Tissues. *Jurnal Penelitian Pendidikan IPA*, *9*(6), 4768–4776. https://doi.org/10.29303/jppipa.v9i6.3857

Hamalik, O. (2003). *Prosedur Belajar Mengajar*. Jakarta: Bumi Aksara.

Jamaluddin, J., Jufri, A. W., & Ramdani, A. (2024). Development of Information Processing Learning Design to Empower Communication and Collaboration Skills of Prospective Biology Teacher Students. *Jurnal Penelitian Pendidikan IPA*, *10*(8), 6267–6276. https://doi.org/10.29303/jppipa.v10i8.8292

Lee, W. W., & Owens, D. L. (2004). *Multimedia-based instructional design: computer-based training, web-based training, distance broadcast training, performance-based solutions*. John Wiley & Sons.

Miranda, J., Navarrete, C., Noguez, J., Molina-Espinosa, J.-M., Ramírez-Montoya, M.-S., Navarro-Tuch, S. A., Bustamante-Bello, M.-R., Rosas-Fernández, J.-B., & Molina, A. (2021). The core components of education 4.0 in higher education: Three case studies in engineering education. *Computers & Electrical Engineering*, *93*, 107278. https://doi.org/10.1016/j.compeleceng.2021.107278

Nahdi, D. S., Yonanda, D. A., & Agustin, N. F. (2018). Upaya Meningkatkan Pemahaman Konsep Siswa Melalui Penerapan Metode Demonstrasi Pada Mata Pelajaran Ipa. *Jurnal Cakrawala Pendas*, *4*(2), 9. https://doi.org/10.31949/jcp.v4i2.1050

Nomleni, F. T., & Manu, T. S. N. (2018). Pengembangan Media Audio Visual dan Alat Peraga dalam Meningkatkan Pemahaman Konsep dan Pemecahan Masalah. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *8*(3), 219–230. https://doi.org/10.24246/j.js.2018.v8.i3.p219-230

Nurhemy, T. N., Santosa, S., & Probosari, R. M. (2011). Penerapan active learning dengan silent demonstration untuk meningkatkan keterampilan proses sains siswa kelas VIII D SMP Negeri 14 Surakarta. *Pendidikan Biologi*, *3*(3), 61–71. Retrieved from

http://jurnal.fkip.uns.ac.id/index.php/bio/article/view/1454

Pettersson, F. (2021). Understanding digitalization and educational change in school by means of activity theory and the levels of learning concept. *Education and Information Technologies*, *26*(1), 187–204. https://doi.org/10.1007/s10639-020-10239-8

Riyanto, N., & Asmara, A. P. (2018). Penilaian Kualitas Media Audio Visual Tentang Karakteristik Larutan Asam Basa Untuk Siswa SMA/MA. *Jurnal Pendidikan Sains (JPS)*, *6*(1), 73. https://doi.org/10.26714/jps.6.1.2018.73-85

Setianingrum, D. A., Ula, E. M., Pratiwi, S., & Jumadi, J. (2022). Development of Science Module based on Flipbook about Physics in the Respiratory System to Improve Students' Learning Independence. *Jurnal Penelitian Pendidikan IPA*, *8*(6), 2621–2628. https://doi.org/10.29303/jppipa.v8i6.1923