



**PENGEMBANGAN VIDEO PEMBELAJARAN UNTUK MENINGKATKAN
MINAT BELAJAR SISWA PADA MATERI PERSILANGAN
MONOHIBRID DAN DIHIBRID**

**DEVELOPMENT OF A LEARNING VIDEO TO INCREASE STUDENTS' INTEREST
IN LEARNING MONOHYBRID AND DIHYBRID CROSSES**

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Abstract. Learning media is one of the most important aspects of the learning process for students. However, students have different learning styles, so the learning media must vary to meet all students' needs. In this study, learning media is developed as videos containing learning material content accompanied by animation. The media used in learning is designed through long stages so that the media can be used optimally. The purpose of this study is to describe the design and development process of learning media in the form of videos on monohybrid and dihybrid crossbreeding material for grade 3 high school with the Four-D (4-D) model. This study uses a descriptive method to describe the application of the modified 4-D model. The study results indicate that the developed learning videos have met the valid criteria and are ready to be used in learning. In addition, respondents also showed a positive response to the developed learning videos. The results of this study can be used by teachers or students to be used as media in learning.

Keywords: *Dihybrid, Learning Media, Learning Videos, Monohybrid*

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INTRODUCTION

Learning is a term that is often used, observed, and studied from the process to the results. The learning process involves various aspects of the individual, including using the five senses, which benefit the person doing it. In addition, learning can also be referred to as an activity that provides changes in knowledge, attitudes, and skills. A person's learning process involves a series of complex stages and requires various efforts in terms of psychological, social, and skill mastery (Korompot et al., 2020).

Learning media acts as a supporting tool in the teaching and learning process, helping to convey messages so that they are easier to understand and enabling the achievement of learning goals effectively and efficiently. Using learning media can increase students' interest in learning new concepts in the material being taught, making the material easier to understand. Interesting media also functions as an effective stimulus in supporting the student learning process. Therefore, optimal management of learning media is very important in formal education environments. This media is the main supporter of learning activities, so teachers need to choose appropriate and relevant media to ensure that the teaching objectives set by the school can be achieved properly (Nurrita, 2018).

Using learning media in the teaching and learning process can generate new interests and desires, stimulate motivation, and encourage student learning activities. In addition, learning media can also have a positive psychological impact on students (Miranda & Wibowo, 2023).

Motivation plays an important role in fostering enthusiasm, pleasure, and enthusiasm for learning. Highly motivated students tend to have more energy to carry out learning activities. Thus, motivation is important in determining how much effort students put into learning (Indriyani, 2019).

In the learning process, especially in genetics material, there are various challenges in achieving learning objectives, both experienced by teachers and students. Difficulties in learning genetics material are generally caused by the nature of the material, which tends to be abstract, and the limitations of learning media that support student understanding. One way to overcome obstacles in learning genetics is to develop learning media that can provide a comprehensive learning experience, increase student motivation, and facilitate understanding of genetic concepts (Hue & Lee, 2024).

Learning media is an effective solution for teachers in the teaching process. Through learning media, educators can convey material using models, pictures, or videos that describe the objects being studied. Along with the advancement of science and technology today, multimedia-based learning media is an alternative way to improve students' understanding while attracting their interest in learning (Rasyid, 2023; Suwarno & Suratsih, 2018). Video is one of the non-printed teaching materials that is rich in information and can convey material directly to students. In addition, the video presents a new dimension in the learning process because of its ability to display moving images accompanied by sound. This media makes students feel like they are in the same location as the video. As is known, student retention levels, namely the absorption and memory of material, can increase significantly when information is received through a combination of the senses of sight and hearing (Rahmadani et al., 2022).

Thus, this article aims to study and develop video-based learning media to increase high school students' interest in learning grade XII on monohybrid and dihybrid crosses. By using interesting and interactive video media, it is hoped that students can more easily understand abstract genetic concepts and increase motivation and active participation in learning.

METHOD

This study uses the Research and Development (R&D) method, which aims to develop and produce products in the form of materials, media, tools, and learning strategies designed to support and improve the learning process in the classroom. R&D research aims to create certain products and test their effectiveness (Sugiyono, 2015). The development model applied is Four-D (4D), which includes the Define, Design, Develop, and Disseminate stages and is implemented from 30 September 2024 to 11 November 2024 (Figure 1).

The subjects of this study were high school students in grade XII who were or had studied monohybrid and dihybrid crosses, and the sample selection was carried out using purposive sampling techniques. The instrument was a non-test instrument in the form of a video learning satisfaction survey distributed after students watched the learning video. The analysis technique used was qualitative descriptive analysis, which aims to describe and provide an overview of a studied phenomenon (Wirartha, 2006).

Development Procedure

This research uses a 4-D development model that includes four main stages: Define, Design, Develop, and Disseminate. Based on Thiagarajan's opinion (1974), each of these stages can be explained as follows:

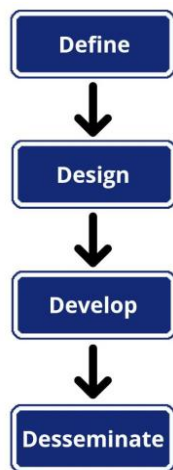


Figure 1. Stages of the 4D RnD Model

Definition Stage

This stage is often referred to as the needs analysis stage, where identification of development needs, requirements that must be met in product development, user needs, and the appropriate research and development model to use is carried out. This analysis process is usually carried out by reviewing literature from previous studies.

Design Stage

The product to be developed is designed based on the content framework obtained from the previous definition stage. The developer determines the type of media to be used by considering the characteristics and relevant learning needs.

Development Stage

This stage has the final product's primary objective, which has been revised based on expert criticism and suggestions. After the design process, the product is assessed and given input by experts to be improved to produce a suitable product for use as a learning medium.

Dissemination Stage

The dissemination stage is when the developer implements the revised product on the target. This stage is carried out so that others can use the product.

RESULTS AND DISCUSSION

Define

Using videos in learning can increase students' learning motivation and help them remember the material presented more easily (Hidayah et al., 2022; Prihatiningtyas & Triatmanto, 2023). This statement is reinforced by Khasanah's research (2023), which shows that video learning media using CapCut software on sound wave material is considered very suitable for use in the teaching and learning process. This assessment is based on three aspects, namely content, language, and presentation, with an average suitability of 88%. CapCut software, as part of technological developments, provides opportunities for teachers to develop more interesting and effective learning media to improve the quality of the learning process.

Design

The video design process is divided into three concepts: media, design, and script (Purba et al., 2023). In this video, the developer chose a learning video as the media to be used. The media selection was based on the results of the needs analysis and previous studies that proved

the effectiveness of learning videos. Then, in designing the design concept, the developer chose the theme of school and class as the main foundation of the learning video. This theme also underlies the development of the teacher animation named "Miss Zea." The design concept is a guideline for designing learning videos, including selecting theme colors, typography, composition, and animation. Finally, the design process includes the script concept, the core of the learning video content. The script acts as a guideline in the video production process, including the sequence of scenes, places, conditions, and dialogues that will be used as references in the production process (Figure 2).



Figure 2. Learning Video Display

Develop

The development stage in the 4D model is when learning media is formed based on the design made in the previous stage. The learning media created is in the form of learning videos. The media is created to meet all students' needs in the teaching and learning process. Learning media is created according to the stages in the 4D model. At this development stage, multimedia learning media in the form of learning videos is produced based on a script developed into a real product. At the development stage, teaching materials are prepared and obtained from books, articles, and other sources following the material presented in the learning video. The content contained in the learning video is equipped with interesting elements and animations so that students do not feel bored when watching it. The final product produced is submitted to the lecturer to be validated by providing criticism and suggestions for improvement and refinement of the media that has been created.

Dissemination

The dissemination stage is carried out by implementing 4D products in the form of learning videos containing biology learning materials on monohybrid and dihybrid crosses, which then fill out a questionnaire on the effectiveness and utilization for high school students in grade XII. This learning video is made as interesting as possible and used as additional learning media to achieve learning objectives. In filling out the questionnaire, the results of the disseminated learning videos consist of utilization in learning, effectiveness in improving learning, quality as a learning method, and the level of suitability with student needs in learning. In filling out the questionnaire, students responded positively to the use of learning videos as additional learning media (Table 1).

The results of a survey that was filled out by 20 students from grade 12 of high school regarding satisfaction with the learning videos show that students are quite satisfied with the learning videos provided. This result shows that learning videos can be an effective and interesting learning medium for grade 12 high school students in understanding monohybrid and dihybrid crossbreeding material. Based on an article written by [Alwi and Agustia \(2024\)](#) states that video media is used as a tool in the learning process to increase student participation and interest in learning and to clarify the contents of the lesson. Learning videos can help educators deliver learning materials so that students can understand the material in depth. Learning videos

can also be used repeatedly and accessed anytime and anywhere. This term makes video one of the effective learning media to use when learning (Wahyuni et al., 2022).

Table 1. Survey Results Data on the Learning Video Questionnaire

Question	Mean
The learning video clearly explains the concept of Genetic Crossbreeding in Grade 12 Biology.	4.45
The material presented in the learning video is under the Grade 12 Biology curriculum.	4.4
The learning video can be easily accessed at any time according to the student's learning needs.	4.4
The learning video helps me learn independently without much guidance from the teacher.	4.1
Watching and listening to the learning video helped me understand difficult biology concepts better.	3.9
The learning video increases my motivation to learn Biology.	4.05
The video makes learning biology more interesting than other methods.	4.05
After watching and listening to the learning video, I feel more confident in facing the exam.	4.2
The sound in the learning video is clear and comfortable to listen to	4.25
The delivery of material in the learning video is not monotonous and attracts my attention	4.25
The duration of the learning video is following my concentration ability as a student	4.1
The material presented in the learning video is well-structured	4

The average score range ranges from 3.9 to 4.45, which is still relatively high. The assessment used is a hedonic scale from 1 to 5, so the average score results are obtained based on the statements given. The statements are related to the Utilization of Learning Videos in Biology Learning, the Effectiveness of Learning Videos in Improving Biology Learning, the Quality of Learning Videos as Learning Media, and the Suitability of Learning Videos to Student Needs. The results of this development still have several shortcomings, such as the limited number of respondents. The limited number of respondents makes the results of this development unable to be generalized widely. A trial on a wider scale is needed so that the results of this development can be seen properly and generalized properly. Trials by comparing other learning media need to be carried out so that the effectiveness of the developed learning videos can be better known.

CONCLUSION

This study develops effective video learning media for monohybrid and dihybrid crossbreeding material for grade XII high school students. The development process follows the 4-D model: define, design, develop, and disseminate. This study contributes to the development of innovative and effective learning media. Overall, the development of video-based learning media can potentially improve the quality of learning in schools, especially in complex and abstract materials. Based on the survey results, students are satisfied with the learning videos provided because they allow students to understand the lesson's contents easily and can be accessed anytime and anywhere.

REFERENCES

- Alwi, N. A., & Agustia, P. L. (2024). Penggunaan media vidio dalam proses pembelajaran di Sekolah Dasar. *Jurnal Bintang Pendidikan Indonesia*, 2(3), 183–190. <https://doi.org/10.55606/jubpi.v2i3.3095>
- Anggraini, Z. D., Damayanti, S., & Setiaji, B. (2024). Pengembangan media powerpoint interaktif dalam konteks pengenalan mekanika lagrange pada siswa sma menggunakan metode 4D. *Jurnal Teknologi Pendidikan*, 1(4), 1–12. <https://doi.org/10.47134/jtp.v1i4.372>
- Hidayah, N., Pamungkas, S. J., & Alamsyah, M. R. N. (2022). Pengembangan Video Pembelajaran Interaktif Materi Fungi Dalam Desain STAD Serta Pengaruhnya Terhadap Pemahaman Konsep Siswa Kelas X SMA Assalam Tempuran. *Jurnal Sains Dan Edukasi Sains*, 5(2), 72–80. <https://doi.org/10.24246/juses.v5i2p72-80>

- Hue, S. M., & Lee, S. W. H. (2024). Learning genetics through an innovative game: Geneblock. *Journal of Biological Education*, 1–11. <https://doi.org/10.1080/00219266.2024.2365671>
- Indriyani, L. (2019). Pemanfaatan media pembelajaran dalam proses belajar untuk meningkatkan kemampuan berpikir kognitif siswa. In *Prosiding Seminar Nasional Pendidikan FKIP*, 2(1), 17–26. <https://jurnal.untirta.ac.id/index.php/psnp/article/view/5682>
- Khasanah, I. N., & Perdana, R. (2023). Pengembangan video pembelajaran dengan software capcut pada materi gelombang bunyi. *Jurnal Inovasi Penelitian dan Pembelajaran Fisika*, 4(2), 71–77. <https://doi.org/10.26418/jippf.v4i2.60794>
- Korompot, S., Rahim, M., & Pakaya, R. (2020). Persepsi siswa tentang faktor yang mempengaruhi minat belajar. *JAMBURA Guidance and Counseling Journal*, 1(1), 40–48. <http://dx.doi.org/10.37411/jgcj.v1i1.136>
- Mawardi, G., Iriani, T., & Daryati, D. (2019). Pengembangan media pembelajaran berbasis multimedia pada mata kuliah kompetensi pembelajaran pokok materi keterampilan dasar mengajar. *J PenSil*, 8(1), 24–30. <http://dx.doi.org/10.21009/jpensil.v8i1.8485>
- Miranda, D., & Wibowo, Y. (2023). Pengembangan Media Pembelajaran Berbasis Aplikasi Android Pada Materi Sistem Pernapasan Kelas XI SMA. *Jurnal Edukasi Biologi*, 9, 77–89. <https://doi.org/10.21831/edubio.v9i1.18146>
- Nurrita, T. (2018). Pengembangan media pembelajaran untuk meningkatkan hasil belajar siswa. *Jurnal misykat*, 3(1), 171–187. <http://dx.doi.org/10.33511/misykat.v3n1.171>
- Prihatiningtyas, A. S., & Triatmanto, T. (2023). Pengembangan Video Pembelajaran Uji Urin Indikasi Kelainan pada Sistem Ekskresi Kelas XI SMA. *Jurnal Edukasi Biologi*, 9(1), 15–21. <https://doi.org/10.21831/edubio.v9i1.18560>
- Purba, B. P. W., Billah Afrianti, F. E. S., Nabilla, M., Adlini, M. N., & Rifda. (2023). PENGEMBANGAN VIDEO PEMBELAJARAN PADA MATERI SISTEM PERNAPASAN DI MADRASAH ALIYAH LABORATORIUM UNIVERSITAS ISLAM NEGERI SUMATERA UTARA MEDAN. *Jurnal Edukasi Biologi*, 9(2), 90–97. <http://dx.doi.org/10.21831/edubio.v9i2.19893>
- Rahmadani, L., Fadilah, M., Darussyamsu, R., Fitri, R., & Farma, S. A. (2022). Analisis penerapan *flipped learning* dalam pembelajaran. *Journal on Teacher Education*, 3(3), 381–387. <https://doi.org/10.31004/jote.v3i3.4984>
- Rasyid, M. (2023). PENGARUH MEDIA PEMBELAJARAN E-ATLAS DENGAN MOTIVASI BELAJAR SISWA SMA. *Jurnal Edukasi Biologi*, 9(2), 128–135. <http://dx.doi.org/10.21831/edubio.v9i2.19277>
- Salsabila, A. H., Iriani, T., & Handoyo, S. S. (2023). Penerapan model 4D Dalam pengembangan video pembelajaran pada keterampilan mengelola kelas. *Jurnal Pendidikan West Science*, 1(08), 495–505. <https://doi.org/10.58812/jpdws.v1i08.553>
- Saputra, D., Ratumbuysang, M. F. N. G., & Utama, A. H. (2021). Pengembangan media pembelajaran pai berbasis infografis dengan materi berwudhu untuk kelas II SD. *J-INSTTECH*, 2(1), 100–105. <https://doi.org/10.20527/j-instech.v2i1.9444>
- Sugiyono. (2015). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Suwarno, R. N., & Suratsih. (2018). Pengembangan Media Educational Game “Bio-Monopoli” Sebagai Media Pembelajaran Submateri Rangka Dan Tulang, Materi Sistem Gerak Untuk Siswa Sma/Ma Kelas Xi Ipa. *Jurnal Edukasi Biologi*, 7(2), 102–113. <https://doi.org/10.21831/edubio.v7i2.13705>
- Thiagarajan, S. (1974). *Instructional Development for Training Teachers of Exceptional Children: A Sourcebook*. Document Resume. Indiana University Press: Bloomington. <https://eric.ed.gov/?id=ED090725>
- Wahyuni, J. S., Haryadi, H., & Nuryatin, A. (2022). Efektivitas penggunaan media pembelajaran berbasis video melalui website rumah belajar pada materi teks eksplanasi. *Silampari*

- Bisa: Jurnal Penelitian Pendidikan Bahasa Indonesia, Daerah, dan Asing*, 5(1), 22–32.
<https://doi.org/10.31540/silamparibisa.v5i1.1617>
- Wirartha, I. M.. (2006). *Metode Penelitian Sosial Ekonomi*. Yogyakarta: Andi Offset.
<https://balaiyanpus.jogjaprovo.go.id/opac/detail-opac?id=12177>