

Research Article



Learning media: Video podcast for biodiversity exploration



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Article Information	ABSTRACT
Submitted: 2023-03-09 Accepted: 2024-02-23 Published: 2024-03-16	<p>Biodiversity includes the distribution of flora and fauna, rainforests, diversity of benefits, and conservation. However, no media, especially video recordings used in the educational process, are available for public viewing and listening. Therefore, it is important to provide valuable and impactful educational resources in the form of video podcasts to facilitate their learning and understanding of biodiversity topics. This study aimed to develop a video podcast learning media on biodiversity material for class X MA DDI Maspul in Bone Regency, assess its validity, evaluate its practicality, and determine its effectiveness. The research method used is R&D (research and development), which refers to the ADDIE model. The subjects of this study were 24 students of class X MA DDI Maspul. The research instruments included validation sheets, student and educator response questionnaires, and learning outcome test questions. Data collection techniques through questionnaires and tests. Quantitative data including validation results, practical scores, and learning outcomes were analyzed descriptively. The results showed, that the developed video podcast learning material demonstrated high validity (average score of 3.7) and was considered very practical by educators and students (average score of 3.2). Additionally, it proved highly effective, with students achieving an average score of 87.6, indicating 100% effectiveness in the learning process. In conclusion, the video podcast learning media developed in this study is valid, practical, and highly effective, making it a suitable teaching tool.</p> <p>Keywords: Explore biodiversity; podcasts; video</p>
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INTRODUCTION

Education is a medium for explaining human life in terms of economy, society, technology, skills, cultural welfare, noble character, national glory, and security (Ilham, 2019). It is an effort to collect information and obtain knowledge to distinguish between useful and non-useful information. Educators plan dynamically to foster self-potential for religious and spiritual abilities, self-supervision, ethics, expertise, noble character, and discipline for oneself, the community, the nation, and the state (Syukri et al., 2019). Indonesia's education system aims to develop competency to educate the nation's life and form a dignified human disposition and civilization, while also developing the ability of students to support human nature, such as being pious, having good morals, being healthy, capable, creative, knowledgeable, independent, democratic, and responsible.

Learning can be obtained both formally and informally because every life is a lesson and everyone is an educator. Learning can change habits, behaviors, and science. It is an effort carried out by educators to deliver knowledge and create a flexible learning system so that students can carry out learning activities optimally (Kirom, 2017). Educators who have mastery of the material and learners who receive the knowledge presented by the educator are essential components of learning. Educators should pay attention to milestones in education so that learning media is needed (Pane & Dasopang, 2017).

The development of learning media has grown rapidly in Indonesia. Learning media is a tool for teachers to stimulate concentration, response, and interest, as well as the expertise and skills of students so that it can trigger a pleasant learning continuity for students and educators. In formal schools, learning media is a necessary tool and part of the learning system. Without it, communication between educators and students will be difficult to convey. In observations and interviews at MA DDI Maspul, Bone, one educator revealed that in biology learning, students have a learning style where they more easily understand learning by watching and listening through the learning media. Several students reported that they understood biology better if they used more interesting media. While textbooks and LCDs are common in schools, they are rarely used for learning. Thus, media is needed that attracts students' attention and suit their learning styles so that they can learn more optimally, whether studying independently or studying together.

Thiyagu (2014) explains technology continues to influence communication in education in diverse ways, with the potential for acquiring and customizing podcasts and various media content for classroom integration. Podcast technology encompasses both audio and video broadcasts that are distributed on the internet and automatically downloaded to computers. Within this field, the terms "vodcast" and "video podcast" refer to video broadcasts, while "podcast" typically pertains to audio files. The utilization of podcasts and video podcasts is steadily growing, with applications ranging from sharing classroom lectures and audiobooks to disseminating student work and class materials, gradually supplanting traditional printed materials in academic literature (Özdener & Güngör, 2010). Various multimedia formats employed in higher education, such as podcasts, have demonstrated their capacity to improve and enrich the learning experience of students (Nicola, 2022).

Several researchers have conducted various research developments regarding podcasts Asmi et al. (2019) have developed podcast-based audio learning media on local history material in South Sumatra. Diana & Saputra (2020), have developed podcast learning media Smamita talks about economics learning at SMA Muhamadiyah 1 Taman. Hutabarat (2020) also reported on the development of podcasts as a media supplement for digital-based learning in higher education. Abidin & Widodo (2020), conducted research on the development of podcast-based audio media and storytelling material for class distance learning in retail business management subjects. Even though these studies have obtained podcast

media products that are valid (feasible) and effective in learning, unfortunately, no one has yet developed a type of video podcast media. All research and development products are in the form of audio podcast media (MP3). In this study, all research and development products are available as audio podcast media (MP3). In this study, the development model used is the ADDIE model. The research instruments included validation sheets, student and educator response questionnaires, and learning outcome test questions. The validation results, practical scores, and learning outcomes as quantitative data were analyzed descriptively. Researchers chose video podcast learning media because the media offers both visual and auditory content, enhancing engagement. They capture facial expressions, body language, and gestures, adding depth to information and making it easier to understand, remember, and stay engaged. This media can deliver complex information. The biodiversity material in biology lessons discusses the level of biodiversity, the distribution of flora and fauna in Indonesia, tropical rainforests, the benefits of biodiversity, and efforts to conserve it. Based on what has been described, the purpose of this research is not only to create video podcast learning material on biodiversity but also to ensure that it meets the criteria of validity, practicality, and effectiveness. By achieving these objectives, the study aims to provide a valuable and impactful educational resource for 10th-grade students at MA DDI Maspul, Bone Regency, facilitating their learning and understanding of the biodiversity topic.

RESEARCH METHODS

This research is in the form of R&D (research and development) and adopts the ADDIE development model, which consists of five stages (Rustandi & Rismayanti, 2021). The first stage was the analysis stage, where activities related to problems and environmental conditions in biology learning were used by the latest curriculum. The second stage was the design stage, where podcast media was designed. The third stage was the development stage, where biodiversity material elaborated into a video podcast and research instruments that measure the product's validity, practicality, and effectiveness developed. The fourth stage was the implementation phase, where the product was applied in real-world situations in the classroom.

The podcast learning media trial was conducted on 24 students of class X MA DDI Maspul as the subjects to determine the practicality and effectiveness of the resulting learning media. The last stage was the evaluation stage, where the media was evaluated and revised. Evaluation is carried out by giving learning outcome tests to students to determine the level of effectiveness of the learning media being developed. In this way, the media that has been created can be known whether it meets initial expectations or not.

Validation sheets, questionnaires for student and teacher responses, and test questions related to learning outcomes were among the research instruments. Methods for gathering data through tests and questionnaires. A descriptive analysis was performed on practical scores and validation results. Quantitative data analysis was obtained from test results and was used to determine learning outcomes before and after receiving treatment.

The data collection instruments used were a validation sheet filled in by two validators to measure the level of validity of the video podcast learning media based on several aspects, namely appearance, media content, and media use. A response questionnaire was filled out by an educator and 24 students to measure the level of practicality and effectiveness of the video podcast learning media. The data analysis techniques on the validation sheet were carried out in the following stages.

a. Determining the average value of each indicator

$$K_i = \frac{\sum_{j=1}^n V_{ji}}{n}$$

information:

V_{ji} = j-th validator value data against i-th indicator

n = multiplicity of indicators

b. Determining the average value of each aspect

$$A_i = \frac{\sum_{j=1}^m K_{ij}}{n}$$

Information:

A_i = average value for the i-th aspect

K_{ij} = average for the ke- i aspect of the ke- j indicator

n = the number of indicators in the i- aspect

c. Determining the average grade on all aspects

$$V_a = \frac{\sum_{i=1}^n A_i}{n}$$

Information:

V_a = total average value of all aspects

A_i = average value for the i- i aspect

n = number of aspects

(Fairuz et al., 2020)

Table 1 presents the assessment criteria used to determine the validity of the video podcast learning media.

Table 1. Validity Criteria

Average Value	Validity criteria
$v > 3.4$	Highly Valid
$2.8 < v \leq 3.4$	Valid
$2.2 < v \leq 2.8$	Quite Valid
$1.6 < v \leq 2.2$	Less Valid
$ln \leq 1.6$	Invalid

The analysis of video podcast learning media was conducted by collecting data through questionnaires that respondents filled out. The respondents comprised both educators and students. The procedure for calculating the student questionnaires was as follows. Finding the total average (X_i).

$$X_i = \frac{\sum_i^n A_i}{n}$$

Information:

X_i = Average Aspects

n = Number of Aspects

(Fairuz et al., 2020)

The percentage results were then categorized based on the assessment reference listed in [Table 2](#).

Table 2. Practicality Criteria

Average Rating	Practicality Criteria
$3.5 \leq X_i \leq 4$	Very Practical
$2.5 \leq X_i < 3.5$	Practical
$1.5 \leq X_i < 2.5$	Quite Practical
$0 \leq X_i < 1.5$	Impractical

The effectiveness of learning was evaluated by analyzing data on student learning achievements. A media was considered effective if at least 80% of students achieved a minimum level of proficiency in the subject, or if at least 80% of students in the class scored at least 70 out of 100 points based on the Minimum Passing Grade (KKM) set by the School of Biology in MA DDI Maspul. This evaluation can be carried out using the following formula.

$$\% \text{ Completeness of learning outcomes} = \frac{\text{number of student who completed}}{\text{number of student}} \times 100$$

Effective learning is defined as reaching 80% of students' learning completion percentage. [Hobri \(2020\)](#) said, that students are said to have completed the learning process if 80% of them get results that are by the criteria or KKM applied at school.

FINDING AND DISCUSSION

The development of video podcast learning media using the ADDIE development model. According to [Bulkani et al. \(2022\)](#), the ADDIE model which included phases for analysis, design, development, implementation, and evaluation, might be utilized to create media. Similar to [Feng & Sangsawang \(2023\)](#), the model offers a methodical way to make instructional materials and courses. The analysis stage of this study consisted of three analyses: (1) needs analysis, which is based on the results of observations and interviews with biology educators at MA DDI Maspul. It was found that students need media to support the learning process, especially in biology subjects, where the media used in the classroom is limited. Biodiversity material has a knowledge domain that is dominated by concepts and facts. In initial observations, students found it difficult to achieve learning objectives. This is indicated by the low number of minimum completion criteria not reaching 50%. (2) the stage of analyzing students' characteristics, which included determining students' learning styles, preferences for audio and visual content, and motivation to learn. (3) material analysis, which involved analyzing the competency standards, basic competencies, and learning objectives for the 2013 Biology curriculum. Additionally, students study environmental issues as part of the Science curriculum. The goal is for them to explain ecosystems and related concepts, question the causes and effects of environmental problems, and acquire knowledge and skills related to biodiversity, endangered species, and what needs to be done to protect these species

(Aydin et al., 2022). The material chosen in this research was biodiversity material with basic competencies, namely analyzing various levels of biodiversity in Indonesia with their threats and conservation.

The design stage involves compiling the necessary components for product development. The content component of this podcast and video learning media consists of podcast titles, learning objectives, discussions in videos, and quizzes. The construction components of the design program were used to support the visualization of the developed product. The development objectives were to provide innovative media for students to be actively involved in the learning process. A valid, practical, and effective learning media was created, and a questionnaire was created to evaluate its feasibility.

The development stage involves creating the podcast video media in stages, including making a video podcast, determining the target audience, choosing the podcast format, creating an outline or script, conducting a video recorder, and editing the video using a Capcut application. There are three episodes of the podcast video, discussing the level of biodiversity, the distribution of flora and fauna in Indonesia, and the benefits, impacts, and efforts to conserve biodiversity. At this stage, skills are needed to produce interesting podcast videos. According to DeMarco (2022), concerning the skills required for podcast production, while prior experience in broadcasting may be advantageous, many of the technical aspects related to editing and recording can be acquired by novice podcasters. However, individuals with the aptitude to recognize crucial aspects in an interview or exhibit strong conversational skills will certainly have an edge in determining which audio segments to include and which to exclude. After developing the product, validation is carried out by experts, and product practicality tests are carried out by teachers and students.

The validity of the video podcast learning media can be determined based on the validator's assessment of several aspects, including appearance, content, and media usage. The validation results for the video podcast learning media can be found in Table 3.

Table 3. The Validation Results for the Video Podcast Learning Media

Assessment Aspects	Valuation	Category
Display	3.6	Highly Valid
Media Content	3.75	Highly Valid
Use of Media	3.75	Highly Valid
Average	3.7	Highly Valid

The display aspect of the podcast media was evaluated and achieved an average score of 3.6, which was considered "very valid." This assessment includes various elements such as design, layout appropriateness, font size, typeface usage, and the clarity of the audio. Fauzi et al., (2019), said that an attractive design adds aesthetic value to the media and appeals to the five human senses, such as sight, hearing, and feeling. The developed video podcast learning media, contains images related to biodiversity material and clear sounds, making it enjoyable for the five human senses. As Hamzah stated, designs for media and teaching materials can increase learning motivation, making the subject matter presented more attractive to learn (Hamzah et al., 2012). Designing video podcasts containing effective teaching guidelines has been carried out previously and the use of podcasts as a cognitive tool and theory for teaching and learning even in e-learning conditions can be used (Makina, 2020).

Since the main objective of biology is to understand nature, a wide range of biology topics can be developed to enhance environmental knowledge and promote the conservation of the environment. Students' understanding of the environment will be based on their understanding of biodiversity,

ecosystems, and the problem, which will help them realize how important the environment is (Adams & Toh, 2021). The content aspect of the material obtained a score of 3.75 under the "very valid" category, indicating that the material formulated in the video podcast learning media is appropriate and aligns with the basic competencies of the curriculum used in the school where the research is conducted. The material also aligns with the learning objectives to be achieved. The video podcast media presents the level of biodiversity, the distribution of flora and fauna in Indonesia, and the impacts and efforts to conserve biodiversity in Indonesia. If we examine it, the knowledge domain in this material leads to knowledge and facts. According to AlFazali et al., (2021), the biodiversity material is interesting because it discusses the environment around us. If so, the biodiversity material is easy for anyone to follow. The assessment of the use of video podcast learning media obtained a score of 3.75 with a "very valid" category. The fact that video podcast learning media can be accessed at any time contributes to this result. Biodiversity material is more interesting because it does not discuss conceptual concepts but also about things that occur in nature. In this video podcast, the consequences of interactions in nature are presented. Such as how changes in forest ecosystems affect biodiversity more broadly (Nugroho et al., 2023; Salsabila et al., 2021).

To determine the validity of media, an average value of $2.8 < v \leq 3.4$ with valid criteria is considered valid. If the value obtained does not reach the standard, a revision is carried out according to the advice of the validator. Then validate and reanalyze it so that it reaches the set standard values (Arsyad, 2007). The average result of the validity level of the podcast video learning media is 3.7, with a "very valid" category, indicating that the value obtained meets the standard value. The video podcast learning media's display can be seen in Figure 1.



Figure 1. Video Podcast Learning Media
[A] Video Cover, [B] Learning Objectives, [C] Display of Images in This Video, and [D] Quiz

During implementation, students followed the researcher's instructions by referring to the RPP that had been designed. The educator divided the learners into five groups, and the researcher provided questions to each group before showing a video podcast created using an LCD. After watching the video

for approximately ten minutes, students discuss the answers to the questions given by the researcher. Then, each group presents the results of its discussion and conducts a Q&A session with the other groups. The results of the teacher and student responses are presented in [Table 4](#).

Table 4. The Practicality Results for the Video Podcast Learning Media

No	Types of Assessments	Average	Assessment Criteria
1	Student Response	3.4	Practical
2	Educator's Response	3.0	Practical
	Total average	3.2	Practical

The teacher's perspective is crucial when assessing learning media. Their opinions are required to offer evaluations and suggestions that will help the developed products get more improve. Since students will be receiving and using the learning media, their rating is also necessary to provide a score for the media ([Mellisa & Yanda, 2019](#)). The practicality of video podcast learning media can be seen from the results of the response questionnaire of students and educators. Based on the data obtained, it is known that this is very practical in its use based on the results of the student response questionnaire, namely 3.4 in the very practical category, while the educator's response result is 3.0 in the practical category. This practicality can be measured based on several aspects, namely benefits, language, appearance, material content, suitability of video podcast learning media with the material, and ease of use.

The practicality of media is important to know because one of the requirements for media to be practical is that it is easy to use by users. The media developed must be easily used by students so that, in the learning process, they do not have difficulties and learning objectives can be achieved. The ease of using teaching materials can also provide a positive response to the learning carried out, such as increasing the attention of students during the learning process ([Annisa et al., 2020](#)). Video podcasts were integrated with multimodal online lessons where the majority of text was used to reinforce subject content rather than provide a complete presentation of material ([Wathne & Brodahl, 2017](#)). In this way, concepts can be learned practically. Furthermore, in this research, it was discovered that it is very easy with videos compared to having to read long texts, the reason is simple and to the point the obstacles in understanding the material are small and the problems are so easy to figure out ([Salsabila et al., 2021](#)).

Based on the description above, video podcast learning media has met the requirements of a media said to be practical and easy to use. This is because this podcast video learning media can not only be seen in schools but can also be accessed or viewed outside the school because this podcast video is uploaded on YouTube so that it can be viewed anytime and anywhere. As it is known, YouTube videos are not merely clips used as teaching stimuli, but they are used as learning tools. The integration of YouTube videos in the learning process supports students' engagement and results in enhancing students' participation in the classroom ([Sherer & Shea, 2011](#)) and increasing students' achievement in learning ([Jones & Cuthrell, 2011](#); [Koto, 2020](#)). According to [Reiman \(2021\)](#), podcasts are easy for students to access. They can play files on smartphones and is no different from playing YouTube videos. Even if the podcast link is linked to the Learning Management System (LMS), becomes easier for students to access it. The same thing was expressed by [Zellatifanny \(2020\)](#) that a video podcast is popular and can be watched using the YouTube platform or Instagram.

Another benefit is that podcasts are free for everybody over the Internet. Once downloaded to the devices, podcasts can be watched at a later period. According [Phillips \(2017\)](#) with mobile gadgets, students can study anywhere, with or without peers. Podcasts themselves offer the added benefit, in that not only are listeners engaged they can also choose to listen whenever and wherever they want and

replay audio segments they have missed. According to [Adams & Toh \(2021\)](#) on video, the users' ability to exercise free will during the media experience. Control refers to how much a user can regulate the pacing and pausing of media content. With the ability to move backward, skip ahead, and reread, users can read at their leisure.

The practicality of this video podcast learning media is also supported by the use of language or sentences that are easy to understand. [Bulkani et al. \(2022\)](#) claims that the media's existence is extremely beneficial to educators since it relieves them of the need to explain things to students orally. This video podcast has the images presented as attractive and, following the content of the material, have an attractive appearance. The practicality of video podcast learning media on biodiversity materials developed is supported by the ease of using these media, as can be seen from the response sheets of educators and students as a result of the level of practicality of the media. Made Ni stated that practicality can be said that learning media is relatively high because the average is at intervals ($3.5 \leq X_i \leq 4$) according to the Likert scale ([Dwijayani, 2017](#)). [Nicola \(2022\)](#) argued that using podcast media in innovative ways to get students involved in the learning process may be both thrilling and challenging. It gives teachers the chance to use creativity in the way they impart knowledge to their students, both academically and practically.

Evaluation is an essential process throughout the previous stages, known as formative evaluation, to identify any revision needs. A summative evaluation was carried out in the final stages of developing the ADDIE model by administering learning outcome tests to students to assess the effectiveness of the developed media. The evaluation stage employed a learning outcomes test with 30 multiple-choice questions. Media is seen in terms of its use as more flexible. Students can learn it in a variety of conditions and occasions, both inside and outside the school. This means that the use of media can increase the efficiency of learning independently. Kosasih said that students can learn the subject matter in it more flexibly, whenever and wherever they are ([Kosasih, 2020](#)). Research by [Chung & Kim \(2015\)](#), found that motivations related to relationship consolidation, joy, and educational attainment were more visible in podcast use. The level of effectiveness of video podcast learning media can be seen in [Table 5](#).

Table 5. The Effectiveness Result for the Video Podcast Learning Media

No	Percentage of Completion	Sum	Percentage (%)
1	0-70	0	0%
2	71-100	24	100%
	Sum	24 people	100%

Effective learning media shows that podcast learning media can be used in student learning activities, improving and developing student abilities with learning outcomes and achieving learning objectives. The effectiveness of video podcast learning media is determined by looking at the results of student tests conducted at the end of learning. Learning outcomes will reflect learners' ability to meet learning experience stage achievements. The instrument used is in the form of test items in the form of multiple-choice questions, as many as 30 in all.

Students are declared complete if they get a score greater than the KKM value ($KKM \geq \text{value}$). The KKM score in MA DDI Maspul for biology subjects is 70. Learning is classically successful if at least 80% of learners achieve a perfect score. The percentage of student learning outcomes shows that 100% of students achieve a complete score, with an average score of 87.6 with 24 students. Based on the results of the analysis, it can be said that the learning media developed are effectively used in learning. According to [Hobri \(2020\)](#), if 80% of students achieve learning completion, it is considered effective. The research

findings of Nicola (2022) concluded that the academic results of technology-based educational methods (podcast media type) were better than traditional methods (84.2%).

Based on the results obtained, the video podcast learning media that has been developed by researchers meets the category of effective. Van and Akker's opinion in Haviz stated that development products are said to be effective if they provide results that are under the learning objectives indicated by the learner learning outcomes test (Haviz, 2013). The effectiveness of the use of video podcast learning media can be seen in the enthusiasm of students for using media to answer biodiversity quizzes. This is due to the development of video podcast learning media that contains information on biodiversity material contained in prepared video podcasts related to the material.

The use of video podcast learning media makes students more enthusiastic and even happy to participate in learning activities, as marked by the activeness of students interacting with educators. In addition, students easily understand the material and can answer the questions given. The use of learning media in the learning process has a great influence on understanding the content of the lesson, logically it can be argued that using learning media will better guarantee a better understanding of students so that it can affect the enthusiasm for learning and more active learning conditions, which later boils down to increasing student understanding (Damayanti, 2013). According to Thiyagu (2014), as the Video Podcast is designed to enhance students' learning capacities, it aids in their comprehension of fundamental material concepts, rendering the learning experience more captivating and enjoyable, thereby capturing students' focus on the subject matter at hand. The Video Podcast proves to be efficacious in fostering students' comprehension skills, encouraging reflective thinking, boosting self-assurance, and diminishing learning apprehension. The result of Wilujeng et al., (2020), research concluded that basically, learning using video media can increase students' mastery of concepts. By using videos, students better understand concepts systematically because they are presented with image and sound. Puspitarini & Hanif (2019) stated that learning media can be a more effective and efficient support aid in achieving learning objectives when employed appropriately throughout the learning process.

Based on the description above, it can be concluded that video podcast learning media can be said to be effective in terms of student learning outcomes where the average student learning outcomes are above the minimum completion score. This affects the learning outcomes of students so that they can think and analyze the subject matter provided by educators well with pleasant learning situations and can understand the lesson easily.

CONCLUSION

The video podcast learning media on biodiversity material has been validated and obtained a very high level of validity with an average score of 3.7. It is also practical, as assessed through questionnaires answered by educators and students with an average score of 3.2. In terms of effectiveness, the video podcast learning media on biodiversity material is considered very effective based on student learning outcome tests with an average score of 87.6 and a completeness percentage of 100%. All things considered, video podcast learning materials can facilitate teaching. The use of video podcasts as a teaching tool holds great potential for enhancing students' learning and understanding of the topic of biodiversity since they provide a dynamic, engaging, and easily accessible medium that may meet the demands of learners.

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