



# Flipbook-Based Project-Based Learning: An Opportunity to Improve Science Literacy

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**Abstract:** Problems that often occur in schools are the use of learning media. Moreover, learning media can make students feel happy. So that the desired abilities can be achieved, such as science literacy. Science literacy is an ability that needs to be improved starting from elementary school. This aims to make students able to later compete in the community environment. This research uses a qualitative descriptive method. This method can be the first step to describe or analyze the problems that occur in the field and will later be developed further. The sources obtained in this study came from interviews with teachers and questionnaires on the favourability of using learning media for students. The result is that students like learning that involves them in learning, coupled with using media that can be seen and heard such as YouTube or multimedia learning. However, many teachers still have difficulty in applying interactive media. The use of flipbooks can be a solution for teachers, considering that teachers have many learning accounts that have access to the use of applications to create flipbooks, such as CanvaPro. This flipbook-based learning media itself is able to make students think creatively and improve science literacy by combining project-based learning (PJBL).

**Keywords:** Learning media; Project-based learning; Science literacy

## Introduction

Science education is one of the important subjects in the education curriculum in Indonesia. Science plays a role in developing students' scientific knowledge, skills, and attitudes. One of the goals of science learning is to improve students' science literacy skills. Implementation of science in learning is closely related to real life so that each individual is able to understand and form their own potential for natural phenomena that occur around them (Agung et al., 2022). In addition, science learning also seeks the formation of science literacy skills or science literacy in students (Humairah et al., 2024). Science learning at the primary level has an important role in shaping students' attitudes and behavior towards the environment. Science learning at the primary level aims to provide basic knowledge and

understanding of the surrounding nature so that students can understand the importance of protecting the environment and biodiversity (Hasibuan & Sapri, 2023).

The development of the 21st century has experienced rapid changes in the field of education. The development of the 2013 curriculum is the orientation of education by taking into account internal and external factors. The development of education in internal factors is the challenge that students must have competence and skills. The external factor of educational development is that students must be able to compete internationally (Mahendri et al., 2022; Umrotun et al., 2022). International student assessment programs are conducted extensively on students' knowledge and skills, with a primary focus on science literacy (Schleocher, 2019). The main competencies of science

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literacy skills consist of (1) explaining the phenomenon of scientific problems, (2) evaluating and designing scientific discoveries, and (3) interpreting data and evidence scientifically (Karakus et al., 2023).

Science literacy is defined as the ability to understand, interpret, and use scientific information in everyday life. Science literacy skills are very important for students to be able to solve problems and make the right decisions related to science and technology. The role of science literacy in science learning is very important because this ability aims to shape a person to be able to use the science concepts possessed in the process of solving and solving scientific problems in life (Umrotun et al., 2022).

There are several factors that cause the lack of science literacy skills, such as the lack of interesting and interactive learning media, less innovative and teacher-centered learning methods, and the lack of opportunities for students to practice and experiment (Nurhanifah & Utami, 2023; Yusmar & Fadilah, 2023). Some of these factors can also be associated with using the PjBL learning model.

According to Aprilia et al., (2022) interactive, innovative creative, and fun learning in science learning is done by applying science literacy in learning and utilizing the environment as a learning resource. Such as through simple observations directly in nature. PjBL is one of the innovative and student-centered learning approaches. In project-based learning (PjBL), students are faced with a project that must be completed using the knowledge and skills they have learned (Retno Widarti et al., 2023; Setyowati, 2022). PjBL can help students to improve science literacy skills, improve critical and creative thinking skills, improve problem solving skills, improve cooperation and communication. PjBL helps students to gain a deeper understanding of environmental issues and the factors that contribute to environmental problems (Sumarni, 2023). In addition, PjBL can also help students develop analytical and problem-solving skills, good teamwork skills, and a more positive attitude toward the environment.

Technological developments that occur in all fields affect the education system. This affects the application of computers in educational training and their application in the education system (Kamil Budiarto, 2021). Digital learning as delivered in the form of digital media (e.g. text or images) via the Internet; and, the learning content and teaching methods provided are to enhance student learning and aim to improve teaching effectiveness or improve personal knowledge and skills. In the era of information and communication technology (ICT) which has developed rapidly as it is today, it is possible to utilize in biology learning in the form of developing multimedia-based learning in a computer

context such as Flip Book (Gusman et al., 2021; Kumalasan & Eilmelda, 2022; Salsabila et al., 2023). Flipbook is a digital learning media that is shaped like an interactive electronic book. Flipbooks can contain text, images, videos, and animations. Flipbooks can be used to help students learn more interestingly and interactively (Gusman et al., 2021).

Several studies have shown that the use of digital books packaged in the form of flipbooks has a positive impact on improving the quality of the learning process and student learning outcomes (Amalia & Fathurrahman, 2023; Qomariyanti & Ermiana, 2023). In addition, the use of website-assisted flipbook-based digital books can improve science literacy skills (Andriani et al., 2023; Ningrum & Ambarwati, 2022). The development of innovative teaching materials will help students prepare for new skills relevant in the 21st century. One of the innovations in the delivery of learning materials is to utilize interactive digital e-books called flipbooks which are one of the solutions in science learning as an effort to improve students' critical thinking skills.

The development of innovative teaching materials will help students prepare for new skills relevant in the 21st century. One of the innovations in the delivery of learning materials is to utilize interactive digital e-books called flipbooks which are one of the solutions in science learning as an effort to improve students' critical thinking skills. This research recommends how the development of flipbook-based science learning media in PjBL learning is expected to help students improve science literacy skills, increase interest in learning science, improve science learning outcomes, and become a solution to improve students' science literacy skills.

## Method

The approach used in this research is a descriptive qualitative approach. Descriptive Qualitative according to (Anggito & Setiawan, 2018) describes an object, phenomenon, or social setting that is poured into narrative writing. The data collected are in the form of words, sentences, or images that have meaning and are able to spur a more real understanding than just numbers or frequencies.

There are several stages to complete the data display, the researcher highlights the comments with comprehensive and in-depth sentence descriptions that accurately describe the actual circumstances. Therefore, the term "qualitative descriptive approach" is often used to refer to qualitative research in general. The purpose of this study is to provide an explanation of the efforts made by educators in using the Project-Based Learning

paradigm to improve the quality of learning (Astuti & Kuswendi, 2022).

The steps in implementing the descriptive method according to (Salim & Haidir, 2019) are as follows; (1) Formulating the problem, (2) determining the type of information needed, (3) determining data collection procedures, (4) determining information in data management procedures, and (5) drawing research conclusions.

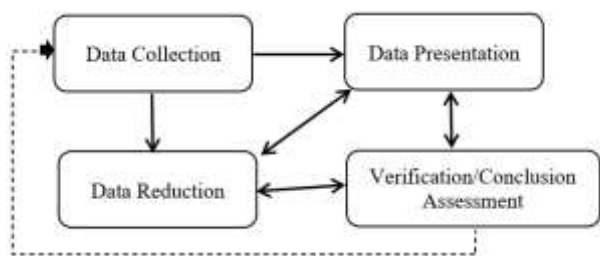


Figure 1. Steps for implementing the descriptive method

Problem formulation is carried out at the same time as determining the type of information used later. In formulating this problem, researchers look for current research trends and then relate them to the problems found. This research uses interviews and questionnaires distributed to teachers and students. This aims to get the results or initial analyses related to what are the obstacles or shortcomings in learning.

### Result and Discussion

This research is a preliminary study related to the phenomena that occur in the field. At this stage, the analysis was obtained from the results of interviews and observations related to the problems of using learning media and science literacy in elementary schools. According to the information collected, learning through media has been used, but not very often, so its application in education is still not optimal. In general, exposing children to various educational media will trigger their curiosity and encourage them to learn. PowerPoint presentations, audio files, YouTube videos and image or photo files are still the only types of media that can be used.

Utilizing media in the classroom is very important. Media, as said by the interviewees, is a great tool to encourage students to understand what they are learning. The challenge in the implementation itself is the various infrastructure and facilities that become obstacles, including the absence of infrastructure. Since the focus has to be used interchangeably, this causes the utilization of the media to be less than optimal. The use of the media itself needs to contribute to the desired outcome. To facilitate feedback between teachers and

students, students should also be involved in the use of the media. Effective learning also requires methodical planning and customization of learning materials. There is no doubt that media that is suitable for student conditions can be used in effective learning (Bagiada & Jayanta, 2022). This is the standard used to measure the successful use of learning media. Learning materials should be aligned with the environment and personal traits of the students.

Learning evaluation is necessary when using the learning media itself. The aim is to ascertain how well students understand the subject matter through the use of the media. Therefore, the teacher's involvement in classroom management is crucial in this situation. Teachers design interesting lesson plans to attract students' interest in learning.

Teachers are still encouraged to include learning resources in their subjects even though most learning is now done in a differentiated way. Today, educators use a wide variety of media, such as pictures, films, videos, and more. Teachers should use learning resources that are close to children's environment because students still need real objects. Because they are currently not able to think abstractly. The following is the percentage of favourability of learning media by students in the class.

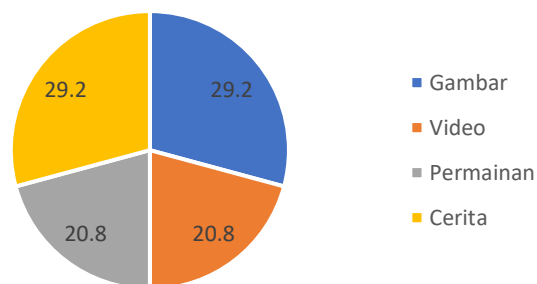


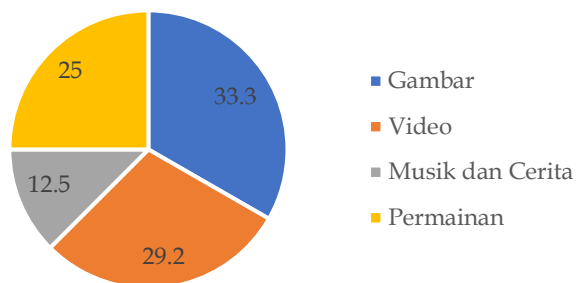
Figure 2. Learning media preferences

After that, the researcher made observations to strengthen the information from the interviews. During these observations, researchers observed teachers using visual aids, especially pictures and videos. The students reacted quite well when the teacher used educational media, especially educational videos, for teaching and learning activities. The researcher noted the way the information was presented. Besides showing the students how to do a good self-introduction, the teacher also showed them a funny and interesting cartoon animation film. The students paid full attention to the video. This shows how learning materials can help students and teachers to communicate, understand the material, and achieve learning objectives.

Research from (Juniawan et al., (2023) that learning media can improve students' literacy skills and have a

positive impact both in the low, medium, and high categories. The ability and understanding of students is certainly one of the main factors in the use of media that has been made. Learning media that have the potential to improve science literacy in high categories are Animated Video Media, ICT Media, Audio Visual Media, Linktree Media, Pop Up Book, Apollo and Comet Media, Water Fence Media, Learning Media Using Ispring Suite 9 Software, Digital Book, Digital Comic Media, Articulate-Based Learning Media, Smart Word Media, Interactive Media, Science Kit Media, Science Literacy-Based Science Learning Media, Animated Video, Learning Video, Flipbook Learning Media, Gadget-Based Interactive Multimedia, Mobile Augmented Reality.

The biggest obstacle for educators who use online learning materials is the creation of IT-based media that must come first. Based on observations and interviews, educators stated that the most difficult part of using online learning materials is the creation of IT-based media. The evidence is that the percentage of the use of learning media in the form of images is the largest of other media, because it is easily accessible and used by teachers and students. This is due to the educators' lack of ability to produce IT-based content. When implementing learning, educators only use existing media and resources from websites such as YouTube.



**Figure 3.** Frequently used learning media

Then the operation of learning media, especially in the form of digital media, is also a difficulty for teachers. Especially teachers who have entered the age of almost retiring. It is the same as said by Winda & Dafit, (2021) that not all teachers can operate online learning media well. There are still many teachers who cannot operate online learning media. In particular, teachers who are elderly. It is very important to use technology for now, in order to maintain the education system in the digital and modern era. The role of parents is now very important after the COVID-19 pandemic in accompanying their children to study at home, especially for elementary school children. However, the

problem with this learning system is the lack of technological skills (Very & Pasha, 2021).

Teachers should participate in training organized by the government as the first step to mitigate the problem of using learning media. As mentioned by Ayu et al., (2021), to ensure learning takes place efficiently, teachers should receive training in the use of learning media. In addition, providing various ICT-based media and resources to facilitate educational activities (Hanannika & Sukartono, 2022). Teachers and students will find it easier to use various learning media resources if adequate facilities and infrastructure are available.

Simple learning media that might be able to support teachers in strengthening 21st-century skills, namely science literacy, is a flipbook. As we know that teachers or educators who already have a learning account certainly have various kinds of advantages, especially in free access to media accounts such as Canva Pro. Canva Pro itself can be a solution for teachers to start learning to use IT-based media such as flipbooks. Flipbook itself can be integrated with Project Based Learning (PJBL) learning.

Learning with the PJBL model can improve students' science literacy skills (Rosyidah, 2020; Rosyidah et al., 2021). In using this learning, students are encouraged to apply various skills. However, it starts with strengthening science literacy (Nurhanifah & Utami, 2023). PJBL learning combined with the use of learning media is very suitable, such as combined with flipbook media. In the research of Mustaghfiroh et al., (2023) also said how effective the use of PJBL is in improving students' science literacy skills. This is also supported by the research of Handayani et al., (2023) and Permatasari et al., (2023) related to the implementation of learning with the PJBL model can improve literacy skills. Therefore, it is necessary to develop flipbook-based science learning media in PJBL learning to improve students' science literacy skills.

**Conclusion**

The a need to develop learning media as a solution to improve students' science literacy skills. Through PJBL learning in the science subject itself. Of course, there are many suitable media used to improve students' science literacy. Various benefits will certainly be obtained in developing learning media, such as teachers who begin to be able to make various kinds of effective and creative learning media. The use of flipbook media is a solution that can be applied. Remind that a teacher or educator who has a learning account. Will learn itself has various advantages, such as free access to various applications. An application that might be used to create a flipbook is Canva Pro. For teachers who are just

starting to learn to make technology-based media, this Canva Pro application is the right application to use.

The development of this learning media itself must also look at the abilities and characteristics of students. The need for us to know students' preferences will be an opportunity for the media we will use in improving science literacy will creak. Moreover, it is associated with PjBl learning. Students are expected to master various 21st-century skills to support their future careers. With the application of projects in learning, students can produce and implement what they learn in their environment or society.

#### Author Contributions

Henzi Haryanto, Hayuni Retno Widarti, and Aynin Mashfufah wrote the introduction, methods, results, discussion, and conclusion. Radeni Sukma Indra Dewi and Shirlu Rizki Kusumaningrum wrote supervised and edited.

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#### Conflicts Of Interest

There is no conflict of interest in this writing.

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