



The Learning Science with Digital Pop-Up Book Media

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Abstract: The era of society 5.0 requires the use of digital technology to be stronger. In this study, it will be seen how the implementation of the use of digital technology in the field of education. The purpose of this study is to determine the design form and efforts to develop Pop-Up Book learning media as learning media. This research method uses the Research and Development (R&D) research type. Research and development (R&D) is a process or method used to validate and develop a product. The results of research on the development of Pop-Up Book Learning Media can improve students' critical thinking skills. Teachers have designed lesson plans, but when viewed from the perspective of learning media, a learning media is needed that is packaged in an interesting and comprehensible manner so as to increase interest in student participation in learning, and also to increase student criticality. Therefore, researchers will develop Pop-Up Book learning media to improve students' critical thinking skills. From the problems that have occurred and from previous research as support, an effort is needed to help solve the problems that occur by developing media that can attract interest and increase student understanding. The development of Pop-Up Book Learning Media to Improve Students' Critical Thinking Skills can be carried out by steps: preliminary studies, preparation of initial product drafts, determining basic competencies, designing Pop-Up Book learning media drafts, designing lesson plans, utilizing selected media, involving students in learning by using media and conducting evaluations and revisions.

Keywords: Digital; Learning; Pop-Up; Science

Introduction

In supporting the improvement of students' critical thinking skills, learning must be packaged systematically and attract students' interest in learning (Libriani et al., 2023), one of which is through learning media provided by the teacher (Luckin et al., 2012). Learning media itself is everything that can be a messenger, a stimulus for thoughts, feelings, and students' willingness and motivation so that it can encourage the process of learning and teaching activities in students and teachers (Hardiansyah, 2022). In other words, learning media is a means of channeling messages or information from teachers to students in carrying out learning (Triana et al., 2023). Teaching materials and learning materials will be more interesting if delivered in the form of multimedia, support from graphics can be presented in the form of delivering

information in the form of text, images, sound, and animation so that it becomes attractive and interactive.

Science (Natural Sciences) is a branch of science that fundamentally studies nature and all its appearances (Coccia, 2020). Science is divided into physics, biology, and chemistry (Rohmawati & Pahlevi, 2023; Ulfi & Hidayati, 2023; Zhang et al., 2020). Both biology, chemistry, and physics also still have classifications in them. Among them, biology also has a part that is related to the discussion of ecosystems (Mutiara & Hardjono, 2023). Ecosystems themselves are part of natural appearances in which they discuss the appearance of interrelated habitats of living things.

Critical thinking is the process of analyzing existing ideas and examining them in detail (Potter, 2022; Susetyarini & Fauzi, 2020). Critical thinking is an investigation that leads to exploration, phenomena, questions or problems to become hypothesis material

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and conclusions from the integration of existing information so that it becomes a convincing justification (Alsaleh, 2020; McGuirk, 2021). From expert opinion, it can be interpreted that critical thinking is a form of investigation by analyzing a matter in order to know in depth. Critical thinking cannot develop only along with the physical development of each individual but also relates to the ability to identify, analyze, and solve problems.

From the results of the preliminary study, the results of the field study, the teacher has designed a lesson plan, but when viewed from the perspective of learning media, a learning media is needed that is packaged in an attractive and comprehensible manner so as to increase interest in student participation in learning, and also to increase student criticality. Therefore, researchers will develop Pop-Up Book learning media to improve students' critical thinking skills. From the problems that have occurred and from previous research as support, an effort is needed to help solve the problems that occur by developing media that can attract students' interest and increase their understanding.

Method

This research method uses the Research and Development (R&D) research type (Hardianto et al., 2023; Kasih & Mawardi, 2023). Research and development (R&D) is a process or method used to validate and develop a product. According to Gall et al. (1996) research and development in education is the use of research findings to create new products and procedures, through field testing research methods, evaluating, and refining to find effectiveness, quality, or specified standards. R&D is a research method used to produce certain products, and test the effectiveness of these products (Ahmadi et al., 2018).

The product to be produced in this study is a Pop-Up Book learning media in 5th grade science subjects to improve critical thinking skills. In this study, the Borg and Gall (R&D) model has been adapted by Sukmadinata (2013). This research procedure uses systematic steps using Sukmadinata's research and development procedures, which are divided into three stages, each of which outlines the sub-steps in it, Preliminary study which contains literature study, needs analysis, and field studies, Design and Development stage which contains media design, limited trials, and expert validation, The testing stage which contains pretest, product implementation, post test, and data analysis where in this stage the experimental method is used to test the effectiveness of the developed media.

Result and Discussion

Technical of Production Learning Media

This research and development produces a product, namely Pop-Up Book learning media to improve students' critical thinking skills. The research and development (R&D) model used is Sukmadinata (2013). The Sukmadinata (2013) which adopts the ten steps of Borg and Gall's R&D, namely: Research and Information Collecting (research and data collection); Planning; Develop Preliminary of Product (development of initial product draft); Preliminary Field Testing (conducting an initial field trial); Main Product Revision (revision of trial results); Main Field Testing (field test for the main product); Operational Product Revision (product revision); Operational Field Testing (wide-scale field test); Final Product Revision (final product revision); and Dissemination and Implementation, into 3 main stages as follows: preliminary Study; design and development; and testing. Meanwhile, the development model used in this research and development is the ASSURE model which consists of 6 stages, namely Analyze Learner; State Objectives; Select Methods, Media, & Materials; Utilize Media & Materials; Require Learner Participation; Evaluate & Revise.

As a support in the learning process, a teacher should be skilled in choosing, making, and using the media used. In this problem, there are several things that teachers need to pay attention to in mastering and using learning media. That learning media can foster student learning motivation because the material is conveyed more interestingly (Pratiwi et al., 2022); mastery of the material becomes better because teaching materials can be accessed repeatedly by students; learning methods become more varied and do not only use verbal words; and learners become more active, because well-designed media can make students become more involved and interact with the media used (Agata et al., 2022; Rahayu et al., 2021).



Figure 1. Model Pop-Up Books For Geometry

The Pop-Up Book learning media developed obtained the results of the material expert validation test obtained a percentage score of 91% including the good category, the results of the media expert test obtained a percentage score of 75% including the good category, and the last was the result of the learning design expert test which obtained a percentage score of 91% including the excellent category so that the Pop-Up Book learning media was validated and declared feasible for trial with revisions according to suggestions by experts.

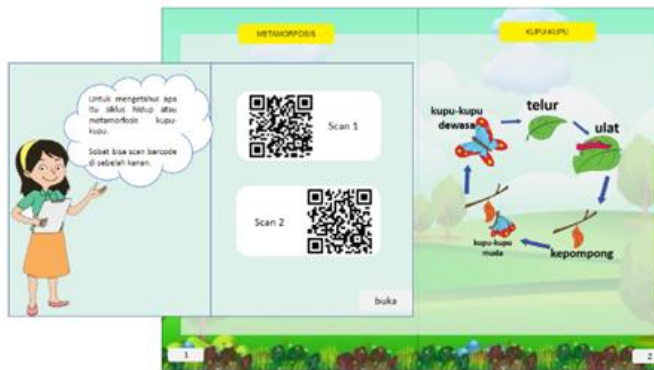


Figure 2. Example of Pop-Up Book for science learning

Strengthening Reading Interest

Motivation has principles including others; motivation as the basic driving force that encourages reading activity (Harpine, 2008a; Harpine 2008b), motivation in the form of praise is better than punishment, motivation is closely related to reading activity. Motivation in the form of praise is better than punishment, motivation is closely related to the needs in learning, motivation can foster optimism in reading (Liu, 2019). needs in learning, motivation can foster optimism in reading, The indicators used include; the existence of desire and desire to succeed, the existence of encouragement and needs in learning, the existence of interesting activities in learning, the existence of interesting activities in learning, the existence of a conducive learning environment (Bahri, 2011).

Reading is the skill of recognizing and understanding writing in the form of a sequence of symbols graphical symbols and their transformation into meaningful speech in the form of tacit understanding or spoken aloud. Reading is a necessity that is important for every human being to have. Reading activity is very necessary humans every day, for example at school, at home when reading newspapers, magazines, storybooks, television and so on. There humans will get various information through the media by having the ability to read.

Having the ability to read by every human being, will will make it easier for humans to adapt to their

environment to live their lives in the future. life in the future. Reading is an activity that involves physical and mental in finding a meaning and writing in books (Aulina, 2012). The reading is the use of language in deciphering writing and symbols to find out the meaning and writing in books in deciphering writing and symbols to find out the meaning to understand the meaning.

Reading skills for children who are still in kindergarten is the ability to read in converting letter symbols into words or sentences. This ability can relate what the child has said when learning symbols and changing them into letters. Thus the child is able to combine sound, how to write and string the letters in the book and the child is able to read them (Ardika et al., 2022).

Children who have been able to read sentences and the meaning of the words they read, children are able to read the words they read. the words they read, the child can already be said to be a child who is able to convey the meaning of the words and sentences that have been read through the form of letters. in conveying the meaning of the words and sentences that have been read orally. A child's inability to read can result in the child experiencing experience obstacles in receiving information, messages from other people or other sources from various social media.

In this case, children who tend to be unable to in reading, can be said to be children who have difficulties in learning. According to Burton in Rovigo & Wijastuti (2019) children who experience learning difficulties if the child has failed to achieve their learning goals. learning difficulties if the child has failed to achieve his learning goals. Reading is an ability that must be possessed by children because with the ability to read, children can know and learn about ability to read children can find out and learn about various subjects.

Therefore, reading is an ability that must be possessed by children and taught starting in kindergarten. Difficulty reading is a condition that causes problems in perception, especially those that affect reading ability (Aphroditta, 2017). Meanwhile, reading difficulties or dyslexia learning is a child's reading ability that is below their ability that should take into account the level of intelligence, age and education. As for children who experience obstacles and difficulties in reading it is possible that it will affect the results. When children experience obstacles in reading activities, it is very influential on the achievement results that children want to achieve.

In addition, it will have an impact on the child's cognition as well and automatically the child's psychology will also be affected. So therefore, it will result in children becoming inferior, not confident and

have a great fear when they are asked to read or show their abilities. When he is asked to read or show his ability to read. The child's psychology will also be affected. As a result, becomes insecure and frightened when the child is given an order related to their his reading ability. According to Mulyono (2003) reading difficulties are as follows: Is Children who often show unnatural reading habits. Children children with reading learning difficulties often experience errors in recognizing words.



Figure 3. Example of pop-up book for science lesson

This type of error includes omission, insertion, replacement, reversal, mispronunciation, changing places, not recognizing words, and jerks. Children who find it difficult to read can also be called children affected by dyslexia which means children who have difficulty reading or reading some sentences and words. Reading some sentences and words. Children who have difficulty reading they will be conspicuously known by many people compared to children who can read in general.

Conclusion

The use of Pop-Up Book Learning Media Development in Science Subjects to Improve Students' Critical Thinking Skills are: 1) Using Pop-Up Book learning media can effectively improve the critical thinking skills of elementary school students. Therefore, it is recommended for teachers to be able to use Pop-Up Book learning media, especially in science materials; 2) use Pop-Up Book products under teacher guidance or assistance so that the material can be absorbed properly by students; 3) Authors and researchers who are interested in the results of this research and

development can utilize it as a reference for further research and development.

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Author Contributions

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Conflicts of Interest

In this research, there is no tug of interest and or hidden interests among the researchers. In addition, this research is also not an order from any funder because it is independent research, or in other words, the research team itself plays a role in preparing proposals, selecting topics, conceptualizing problems, collecting data, analyzing problems, drawing conclusions until the publication stage in this journal.

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