ISSN xxxx-xxxx (Print)
E-ISSN xxxx-xxxx (Online)
Journal of Learners, Education, and Development
Published by Primary School Teacher Education (PGSD) Program, Universitas Trunodjoyo Madura

# Development of the Pop-Up Book Media "Digestive Exploration" for the Science and Social Studies (IPAS) Subject on the Human Digestive System for Grade V at SDN Tanjung 1

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***Key Words:***

Learning Media, *Pop Up Book,* Human Digestive System

**Abstract:** This study aimed to develop the Pop-Up Book learning media entitled *"Digestive Exploration"* for the Science and Social Studies (IPAS) subject on the topic of the human digestive system for Grade V students at SDN Tanjung 1 Pamekasan. This research was a development study (R&D) using the ADDIE model. The subjects of this study were 19 Grade V students of SDN Tanjung 1. The validity results were obtained from expert validation, consisting of 90% from learning media experts, 80% from material design experts, and 92.5% from instructional design experts, with all three validations categorized as highly valid. The attractiveness results were obtained through questionnaires, with the teacher response questionnaire in the field trial achieving 97.5%, and the student response questionnaire in the field trial achieving 87.5%, both categorized as highly attractive. The effectiveness results were obtained through observations of teacher activities, with an average percentage of 95% categorized as highly active, observations of student activities with an average percentage of 96% categorized as highly active, and student learning outcome tests showing that 14 students achieved mastery by obtaining scores above the Minimum Learning Achievement Criteria (KKTP) of 70. Classically, student learning mastery reached a percentage of 100%. Based on the data above, the Pop-Up Book media *"Digestive Exploration"* was declared valid, attractive, and effective for use in teaching and learning activities for Grade V students at SDN Tanjung 1.

**Nikmah A**. (2026). Development of the Pop-Up Book Media "Digestive Exploration" for the Science and Social Studies (IPAS) Subject on the Human Digestive System for Grade V at SDN Tanjung 1 . ***JLEAD: Journal of Learners and Educational Development***. *Primary School Teacher Education Program, Universitas Trunodjoyo Madura*

## INTRODUCTION

Education is a consciously and systematically designed process intended to help individuals acquire knowledge, develop skills, and form positive attitudes in order to improve their quality of life (Hamzah et al., 2022). As the right of every citizen, education must be optimally implemented as mandated in Law Number 20 of 2003, which emphasizes that the purpose of national education is to develop learners' potential so that they become individuals who are faithful, devoted to God, possess noble character, and have adequate knowledge and competencies.

The achievement of these objectives is carried out through a learning process designed in alignment with the curriculum, students' needs, and the availability of learning resources. Learning objectives encompass three main domains, namely cognitive, affective, and psychomotor, all of which must be mastered by students in a balanced manner (Nurrita, 2018). To achieve these objectives optimally, meaningful learning is required, namely a learning process that connects new knowledge with students' prior experiences and real-life contexts. This approach is

ISSN xxxx-xxxx (Print)
E-ISSN xxxx-xxxx (Online)
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capable of increasing students' active engagement and reducing boredom in learning (Khoerunnisa et al., 2024). Ideally, learning should not only be teacher-centered but should be oriented toward student-centered learning, in which students play an active role in observing, questioning, exploring, and reflecting on learning materials. Such conditions can encourage deeper understanding and higher-order thinking skills (Efendi et al., 2025). Therefore, learning innovation has become a necessity in modern education, such as the Merdeka Curriculum, which emphasizes authentic and relevant learning as well as the development of twenty-first-century skills, including critical thinking, creativity, collaboration, and problem-solving (Zein Damanik et al., 2025).

One form of learning innovation that can be implemented is the use of learning media. Learning media function as tools to present material in a more attractive, clear, and contextual manner, thereby helping students understand abstract concepts. In Science and Social Studies (IPAS) learning, which integrates scientific and social aspects, the need for learning media becomes increasingly complex because the material often requires concrete representation to facilitate students' understanding (Anggraini et al., 2024). Media capable of providing real experiences or concrete visualizations have been proven to improve students' engagement and understanding of learning materials (Karnasih et al., 2025).

However, in practice, the use of varied learning media that suit students' needs remains a challenge. This condition has an impact on students' low level of understanding, especially in abstract materials such as the human digestive system. Therefore, learning media are needed that can present concepts concretely, attractively, and interactively. Pop-up book media is one relevant alternative solution because it provides three-dimensional visualizations that can help students understand concepts more realistically. In addition, this media can increase learning interest, motivation, and students' active involvement in the learning process. Therefore, this study aims to develop the pop-up book media entitled *"Digestive Exploration"* on the topic of the human digestive system as an effort to support more meaningful and effective learning.

## METHODS

This study employed the Research and Development (R&D) method, which is a research method aimed at developing a product while also testing its effectiveness in the learning process (Sugiyono, 2017). This method was chosen because it is appropriate for producing tangible products that can be directly utilized, unlike conventional research which generally only produces recommendations (Sutarti & Irawan, 2017). The product developed in this study was the "Digestive Adventure" Pop Up Book learning media for the Science and Social Studies (IPAS) subject for fifth-grade elementary school students. The development model used in this study was the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation (A. Hamzah, 2020).

At the analysis stage, an analysis of competencies, students' needs, and learning materials was conducted through interviews, observations, and questionnaires in the fifth grade of SDN Tanjung 1 Pamekasan. The design stage included designing the "Digestive Adventure" Pop Up Book. The development stage was carried out by transforming the design into a tangible product and validating it through expert review. Furthermore, the implementation stage was conducted through a trial involving 19 fifth-grade students. The final stage, evaluation, aimed to assess the effectiveness of the media on students' learning outcomes.

The data collection techniques used in this study included observations of teacher and student activities, validation questionnaires and response questionnaires, learning outcome tests, and documentation. The data collection instruments used consisted of observation sheets, questionnaire sheets, test sheets, and documentation.

## RESULTS

### Description of Development Results

The results of this development research consist of: (1) the "Digestive Adventure" Pop Up Book media product for Grade V on the topic of the Human Digestive System, and (2) the analysis of the validity, attractiveness, and effectiveness of the "Digestive Adventure" Pop Up Book media for Grade V on the topic of the Human Digestive System.

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**Development Procedure Analysis Stage**

The analysis stage was the initial stage aimed at identifying the needs in product development through the analysis of competencies, students' needs, and learning materials. The competency analysis was conducted by reviewing the Learning Outcomes in the Merdeka Curriculum implemented in Grade V at SDN Tanjung 1 Pamekasan, focusing on the Science and Social Studies (IPAS) subject, which had the lowest level of learning mastery, particularly on the topic of the human digestive system. The analysis of students' needs was carried out through interviews, observations, and questionnaires, which revealed that teachers were still limited in using learning media, causing the learning process to become monotonous and making it difficult for students to understand the material. The questionnaire results also indicated that the majority of students were more interested in, more active with, and preferred concrete learning media; however, its use was still limited. Meanwhile, the material analysis was conducted to ensure the suitability of the media content with the learning outcomes, focusing on Grade V IPAS Chapter 5 Topic B, "Why Do We Need to Eat and Drink?" related to the human digestive system.

**Design Stage**

The design stage was the initial planning stage of the learning media through the creation of storyboards and product designs adjusted to the learning objectives, students' characteristics, and the problems identified. The storyboard was arranged to illustrate the content of each page of the "Digestive Adventure" Pop Up Book, including the introduction, content, and closing sections. The content section presented material on the human digestive system from the mouth to the anus using interactive elements such as pop-up images, sliding features, and open-close mechanisms. This design aimed to produce media that is attractive, interactive, and able to facilitate students' understanding of the material.

**Development Stage**

The development stage was carried out by developing the learning media in the form of the "Digestive Adventure" Pop Up Book, which consisted of 10 pages covering the introduction, the human digestive system material, and the closing section. After the product was completed, validation was conducted by three experts, namely a media expert, a material expert, and a learning design expert, to obtain assessments, critiques, and suggestions for improvement. The validation results showed high scores with several suggestions, such as improving image displays, adding page numbers, and completing the material and practice exercises. In general, the media was declared feasible and suitable for use in the trial stage after revisions were made according to the validators' suggestions.

**Implementation Stage**

The implementation stage was conducted after the "Digestive Adventure" Pop Up Book media had been validated and revised according to expert suggestions. At this stage, the media was tested on Grade V students of SDN Tanjung 1 Pamekasan through small group trials and field trials involving a total of 19 students. The learning process was observed by observers using teacher and student activity observation sheets, while teachers and students as respondents provided assessments through response questionnaires. The small group trial involved 4 students and was conducted in two meetings to determine the attractiveness and effectiveness of the developed media.

**Evaluation Stage**

The evaluation stage was the final stage in the ADDIE model aimed at assessing and refining the "Digestive Adventure" Pop Up Book media. The evaluation consisted of two types: formative and summative evaluation. Formative evaluation was conducted based on feedback from experts, including improvements in media aspects (adding page numbers and improving images), material aspects (adding practice exercises and completing the material), and learning design aspects (adjusting terminology, adding descriptions, and correcting writing errors). Meanwhile, summative evaluation was conducted to determine the effectiveness of the product through students' learning outcome tests in the field trial. The results showed that all students (100%) achieved mastery both individually and classically (≥85%), indicating that the "Digestive Adventure" Pop Up Book media was effective for use in learning activities.

**Results of Media Validity Data Analysis**

The validity analysis of the "Digestive Adventure" Pop Up Book media was obtained through validation results from media experts, material experts, and learning design experts, which were calculated in percentage form and compared with the validity criteria. The results showed that the media expert validation obtained 90% (highly valid), the material expert obtained 80% (valid), and the learning design expert obtained 92.5% (highly valid). Therefore, overall, the "Digestive Adventure" Pop Up Book media was declared to have a high level of validity and was feasible for use in the learning process.

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E-ISSN xxxx-xxxx (Online)
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**Figure 1.** Validity Test Results Diagram of Expert Validation

**Media Attractiveness**

The attractiveness analysis of the "Digestive Adventure" Pop Up Book media was obtained from teacher and student response questionnaires in the small group trial and field trial. In the small group trial, the average percentage of teacher responses was 92.5% and student responses were 90.5%, both categorized as "very attractive." Meanwhile, in the field trial, the average percentage of teacher responses was 97.5% and student responses were 87.75%, which were also categorized as "very attractive." Therefore, the "Digestive Adventure" Pop Up Book media was considered highly attractive and capable of increasing students' interest and engagement in the learning process.




**Figure 4.2** Results of the Attractiveness Test of the "Digestive Adventure" Pop Up Book Media.

**Media Effectiveness**

The effectiveness analysis of the "Digestive Adventure" Pop Up Book media was reviewed based on observations of teacher activities, student activities, and learning test results in the small group and field trials. In the small group trial, teacher activities obtained an average score of 95% (very active) and student activities obtained 91.75% (very active), with students' learning mastery reaching 100% classically. In the field trial, teacher activities also reached 95% and student activities reached 96%, both categorized as very active, while students' learning mastery again reached 100%. Based on these results, all indicators of effectiveness were fulfilled, indicating that the "Digestive Adventure" Pop Up Book media was effective for use in the learning process.

ISSN xxxx-xxxx (Print)
E-ISSN xxxx-xxxx (Online)
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**Figure 4.3** Diagram of the Effectiveness Calculation Results of the "Digestive Adventure" Pop Up Book Media

## DISCUSSION

This research and development study aimed to produce the "Digestive Adventure" Pop Up Book learning media that is valid, effective, and attractive for fifth-grade students at SDN Tanjung 1 Pamekasan. The model used was ADDIE (Analysis, Design, Development, Implementation, Evaluation) because it has systematic stages and is suitable for developing learning products based on students' needs.

At the analysis stage, it was found that the learning process was still dominated by the use of simple media in the form of pictures in student textbooks, which were less able to attract students' attention and encourage active participation. This condition affected students' low understanding of the human digestive system material. The questionnaire results also showed that students were more interested and active when using concrete learning media. Therefore, the development of Pop Up Book media became a relevant solution to overcome these problems.

At the design stage, the media was developed through the preparation of storyboards and visual designs adjusted to the characteristics of elementary school students. The use of attractive illustrations and interactive elements such as movable and open-close sections was designed to increase students' engagement in the learning process.

The development stage resulted in a Pop Up Book product, which was then validated by media experts, material experts, and learning design experts. The validation results showed that the media was categorized as valid to highly valid. This indicated that the product had fulfilled the aspects of content feasibility, visual appearance, and suitability with learning objectives. These findings are in line with the opinion that good learning media should meet content and construct validity in order to be feasible for use in learning activities.

At the implementation stage, the media was tested through small group and field trials. The results showed that the media was able to improve teacher and student activities during the learning process. Students became more active, enthusiastic, and engaged in learning activities. In addition, all students achieved classical learning mastery, indicating that the developed media was effective in improving learning outcomes.

Furthermore, at the evaluation stage, it was found that the "Digestive Adventure" Pop Up Book media was not only effective but also highly attractive. This was shown by the results of teacher and student response questionnaires, which were categorized as very high. The attractiveness of the media was influenced by its appealing visual design, ease of use, and the direct learning experiences provided to students.

From the validity aspect, the developed Pop Up Book media obtained valid to highly valid categories based on assessments from media experts, material experts, and learning design experts. This indicated that the media was

ISSN xxxx-xxxx (Print)
E-ISSN xxxx-xxxx (Online)
Journal of Learners, Education, and Development
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appropriate for learning needs, students' characteristics, and the learning outcomes established in the curriculum. High validity indicated that the material content, visual appearance, and learning design had been well integrated, making the media feasible for use as a learning medium in elementary schools.

From the attractiveness aspect, the results of teacher and student response questionnaires showed that the media was categorized as highly attractive. This indicated that the use of three-dimensional visual-based media was able to increase students' interest and attention during the learning process. These findings are consistent with the concept of meaningful learning, in which students can understand material more easily when it is presented concretely and contextually. In addition, the interactive characteristics of the pop up book also encouraged students' active involvement, making the learning process more enjoyable and less monotonous.

From the effectiveness aspect, the research results showed that the use of the Pop Up Book media was able to improve teacher and student activities as well as students' learning outcomes. Learning activities were categorized as very active, and students' learning mastery reached 100% classically. This indicated that the developed media was not only attractive but also capable of helping students understand abstract concepts, such as the human digestive system. Therefore, this media was effective in improving the quality of learning, both in terms of process and outcomes.

Overall, the results of this study reinforce previous research findings stating that the use of concrete and interactive learning media can improve students' conceptual understanding and learning outcomes. In addition, this study also provides a new contribution in the form of developing a pop up book media equipped with interactive features and a visual approach suited to the characteristics of IPAS material.

The implications of this study indicate that teachers need to be more creative in developing and using innovative learning media, especially for abstract materials. The "Digestive Adventure" Pop Up Book media can serve as an alternative solution in creating more meaningful and student-centered learning. However, this study has limitations, as it was conducted in only one class with a limited number of subjects. Therefore, future research is recommended to test the use of this media on a broader scale and to develop similar media for other materials in order to obtain more comprehensive results.

## CONCLUSION

Based on the results of the research and development, the "Digestive Adventure" Pop Up Book media was developed using the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. The resulting product was a learning media on the human digestive system for fifth-grade students at SDN Tanjung 1 Pamekasan.

The research results showed that the developed media fulfilled the feasibility criteria. From the validity aspect, the media obtained valid to highly valid categories with percentages of 90% (media expert), 80% (material expert), and 92.5% (learning design expert). From the attractiveness aspect, the media was categorized as highly attractive, with teacher response percentages reaching 97.5% and student responses reaching 87.75%. Meanwhile, from the effectiveness aspect, the media was declared effective, with students' learning outcomes achieving 100% classical mastery, while teacher and student activities were categorized as very active with percentages of 95% and 96%, respectively.

Therefore, the "Digestive Adventure" Pop Up Book media was declared valid, highly attractive, and effective, making it feasible for use as a Science and Social Studies (IPAS) learning medium on the topic of the human digestive system in elementary schools.

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ISSN xxxx-xxxx (Print)
E-ISSN xxxx-xxxx (Online)
Journal of Learners, Education, and Development
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## ACKNOWLEDGEMENT

The author would like to express sincere gratitude to SDN Tanjung 1 Pamekasan for granting permission and support for this research. Special thanks are also extended to Mrs. Farisa Rismayanti, S.Pd., as the fifth-grade teacher, for her assistance during the research process. Appreciation is also given to the expert validators, Mr. Fachrur Rozie, S.Pd., M.Pd., Mrs. Dyah Qurotul A'yun, S.Pd., M.Pd., and Mrs. Nilamsari Damayanti Fajrin, S.Pd., M.Pd., for their valuable suggestions and evaluations. The author would also like to thank Mrs. Ika Dian Rahmawati, S.Pd., M.Pd., as the academic supervisor for her guidance and support throughout this research. Finally, the author expresses gratitude to the fifth-grade students of SDN Tanjung 1 Pamekasan and all parties who contributed to the successful completion of this research.

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E-ISSN xxxx-xxxx (Online)
Journal of Learners, Education, and Development
Published by Primary School Teacher Education (PGSD) Program, Universitas Trunodjoyo Madura

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