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Harnessing Flipbook-Based E-Modules to Foster Creativity in Science Education: A Systematic Review

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Abstract: Digital-based learning is a transformation of education. Teachers can now distribute lesson materials in a more effective and interesting manner thanks to a variety of tools and platforms. Among the most notable innovations in this area is is the use of e-modules, particularly flipbook-based e-modules. Students can immediately engage with the curriculum, explore, and develop their creativity in this more dynamic and interactive learning environment. The purpose of this study is to examine how flipbook-based IPAS e-modules can be used to enhance students' creativity. This research method employs SLR (Systematic Literature Review) following the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) guidelines, which involves analyzing several articles related to how the use of flipbook-based e-modules can enhance students' creativity, thereby achieving the expected learning outcomes, especially in the subject of IPAS. In order to find relevant publications for this literature review, the Publish or Perish (PoP) tool, which is indexed by Google Scholar, was used. Title, abstract, introduction, methods, results, discussions, and conclusions are the seven components of the PRISMA concept, which was used to assess the relevant articles after they were found using the requested keywords. The PoP program that is connected with Google Scholar has identified 25 out of 305 articles. The results of the study show that using e-modules based on flipbooks is able to increase students' creativity and produce the desired learning results. The use of flipbook-based e-modules certainly shows great potential in supporting more innovative and effective education.

Keywords: e-module, flipbook, student creativity, IPAS, teaching materials.

▪ INTRODUCTION

At the elementary school level, integrated learning offers several significant benefits for the growth of students. Through a variety of exercises that span several areas, this method enables students to investigate and communicate their knowledge and abilities (Zaenatun et al., 2021). Students are better able to comprehend ideas in their whole and recognize the links between different fields, which fosters critical and creative thinking. Furthermore, integrated learning makes the material more relatable to students' everyday lives, making it easier for them to comprehend and apply the knowledge obtained in real-life contexts (Pawartani et al., 2024).

An educational strategy known as "integrated learning" combines different disciplines to give students a more comprehensive and meaningful educational experience (Helmane & Briška, 2019). With this methodology, learning is provided in a integrated context rather than being divided into disciplines, enabling students to comprehend and apply the relationships between topics. Not only emphasizing the aspect of knowledge, but also the aspects of attitude and skills (Ansori, 2020).

The revisions to the curriculum framework are outlined in Government Regulation number 57 of 2021 concerning the National Education Standards for the Independent Curriculum. One of these is the creation of Natural and Social Sciences (IPAS), a single topic that combines the Natural Sciences (IPA) and Social Sciences (IPS). This idea is in line with the Merdeka Curriculum policy, which seeks to raise educational standards and

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make learning more applicable to students' everyday lives. In the context of everyday life, IPAS learning gives a strong emphasis on the relationship between social and scientific elements. The goal of integrating science and social studies is to create a more comprehensive, multidisciplinary, and contextual education, according to the Ministry of Education, Culture, Research, and Technology (2021). Students are supposed to comprehend the connection between natural events and their effects on the environment and society by combining these two fields. IPAS learning supports the development of students' literacy and numeracy skills. Teacher can teach the students how to use these abilities in practical settings by utilizing the scientific and social studies framework. This is important to prepare them to face challenges in the era of globalization(Agustin & Adi Winanto, 2023).

The goal of IPAS (Natural and Social Sciences) education is to stimulate a high level of students' curiosity in the natural world around them. Students are encouraged to observe, analyze, and discuss about a various natural events and and how they affect the social and cultural landscape through this integrated approach. Students learn about the scientific methods involved in weather change, for instance, as well as how these changes impact the everyday lives of the communities in which they live (Sadiah et al., 2024). Students can gain a deeper and more relevant understanding of the world around them by relating scientific ideas to social and environmental situations. This improves their academic understanding while also raising awareness of the significance of preserving the harmony between human's life and nature. Thus, IPAS education is crucial in building a generation that is aware of social and environmental challenges and encourages them to take an active role in seeking solutions to the situations they confront. (BSAKP, 2022).

Students are encouraged to solve problems using critical and creative thinking in the integrated IPAS learning model. Students can acquire critical and creative thinking abilities that are applicable to real-world situations by utilizing active learning strategies including group discussions, collaborative projects, and interactive media (Suhelayanti et al., 2023). Students who are creative might come up with a lot of responses or ideas quickly. When presented with a problem or question, they can offer a variety of solutions, showing the capacity to think quickly and productively (Yusri, 2020). High levels of imagination are frequently linked to creativity. Children with strong imaginations can envision new scenarios, create stories, or draw in unique ways (Lestari et al., 2023).

It is expected that IPAS learning will give elementary school students a more comprehensive and fulfilling educational experience, equipping them with the necessary abilities to handle challenges in the future. The reality on the ground however, is evident that many schools have their own policies that are adapted to the requirements and circumstances of the local community (Komariah et al., 2023). Each school is in fact granted the power to create its own curriculum, including how IPAS learning is organized, within the parameters of the Merdeka Curriculum. Nevertheless, this has led to differences in how the two IPAS subjects are implemented; some schools may still give the science subject in the first semester and the social science subject in the second, or they may deliver the science subject at the start of the semester and the social science subject in the second half-semester (Wanti & Chastanti, 2023). Such policies result in Science and Social Studies courses remaining autonomous, with just the titles being altered to IPAS (Susilowati, 2023). Additionally, teachers frequently control the teaching of social studies and science independently, and the learning is occasionally still

conventional. The teacher-centered nature of traditional education restricts students' creativity because there is little opportunity for interaction and active participation in the learning process (Elisya et al., 2023). The material presented in this course appears to be merely informative, and students are expected to commit the theories to memory. Therefore, the IPAS learning that is offered only concentrates on memorization of theories, concepts, and terms.

The role of the teacher is crucial in IPAS learning; in order to make IPAS learning engaging and significant for students, teachers need to be innovative and creative (L. Novitasari et al., 2023). Teachers should, at least, be professionally knowledgeable about the content recommended by the Ministry of Education and Culture (Kemendikbud). Teachers who possess a thorough understanding are able to can design learning activities that are not only informative but also interactive that inspire students to think critically and creatively (Agustina et al., 2022).

One of the criteria for a creative and innovative teacher is a teacher who designs their own teaching materials according to the needs of their students. These teaching resources can help students become more interested to learn(Lubis et al., 2022). In this highly technologically advanced day, teachers also need to be tech-savvy. Teachers need to be able to make use of the latest technological developments. There are undoubtedly many benefits to this technology's sophistication in all domains, but particularly in education. Information and communication technology has significantly transformed teaching and learning strategies in the educational setting. Teachers can now offer instructional materials in a more dynamic and attractive manner thanks to a variety of digital technologies at their disposal. Teachers can also incorporate audio and visual components into their lesson plans by using engaging platforms (Sarjiyati, 2017).

Educators must be aware of the necessity to develop new, creative, and attractive teaching materials, particularly in the field of Natural Sciences (IPAS), (Putri et al., 2024). This is crucial for improving students' comprehension of the subject matter and increasing their involvement in the learning process. In addition to grabbing students' interest, attractive IPAS teaching resources can not only capture students' attention but also motivate them to actively engage in class activities.

The usage of flipbook-based e-modules is one of the innovations in IPAS teaching materials that has attracted students' interest. In addition to being a teaching tool, this flipbook-based e-module is an interactive tool that can advance the comprehension of IPAS material. Furthermore, it can improve students' creative thinking skills (Bunari et al., 2024). Using flipbooks in IPAS courses is a creative way to create technologically integrated teaching materials that can greatly aid in the learning process of the students. A flipbook is a learning tool that displays information in a digital book format that can be opened and read by turning the pages, much like a real book (Ulandari et al., 2022). Originally consisting of sheets of paper arranged in a calendar format, flipbooks are now available in digital formats because of technological advancements (D. Novitasari et al., 2023). This digital flipbook makes studying more interesting and less boring by giving users access to more interactive content, such as text, photos, videos, and audio.

There are a number of reasons why flipbook technology is chosen over other digital learning resources. The first benefit of flipbooks is their interactivity, which enables students to engage more directly with the course content. Students may effortlessly navigate between pages because of the user-friendly navigation feature, which makes

learning more interesting and enjoyable(Aisyah & Mustaji, 2023). Second, the flipbook's ability to successfully blend text and visuals makes it easier to teach difficult IPAS topics to students in a way that is more visually appealing and captivating (Saputra et al., 2024). Third, modern media encourages students to learn independently by supporting autonomous learning, which allows them to access information anytime and anywhere.

In the context of adopting the Merdeka Curriculum, however, flipbooks as teaching resources for IPAS continue to face numerous obstacles in many schools when it comes to developing really creative learning materials (Lakapu et al., 2023). Many schools continue to use conventional teaching techniques and are hardly able to adapt teaching materials that align with the principles of this new curriculum. Furthermore, a barrier to developing creative teaching resources is the absence of teacher training on the use of educational technology (Mumtaz, 2000). Consequently, more research is needed to determine how flipbooks can be used by teachers to be effectively integrated into the Merdeka curriculum as teaching materials for IPAS subjects, so that IPAS learning becomes more optimal.

It turns out that schools who have already been using flipbooks as teaching resources for the Merdeka Curriculum's Natural and Social Sciences (IPAS) still encounter a number of difficulties (Wuryandani, 2024). As demonstrated by the rise in average post-test scores of students following their use of flipbooks as a learning tool, multiple research have demonstrated that flipbook media can enhance student learning outcomes (Aisyah & Mustaji, 2023). It turns out that there are still issues that need to be thoroughly studied, including how this flipbook's efficacy can change depending on the situation and the students' traits, fostering greater student creativity and achieving the desired learning results in IPAS. The impact of using flipbooks in IPAS lessons will also be covered in this study, along with the differences between schools with and without great access to technology and how the effectiveness of this flipbook-based e-module can foster students' creativity in learning IPAS by enabling them to explore ideas about natural phenomena that are interwoven with their local environment. Additionally, students' curiosity and desire to learn grow, which raises their level of intrinsic motivation. Additionally, it is anticipated that this research would significantly aid in the creation of more creative and relevant teaching methods in Indonesian schools.

▪ METHOD

Research Design

The research method used in this study is a Systematic Literature Review (SLR) following the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) guidelines. According to (Csiba-Herczeg et al., 2023), the purpose of this method is to summarize existing knowledge, identify patterns and gaps in research, and provide an objective literature review. This method establishes a framework that defines the steps for reference search and is accepted for conducting SLR in the academic world. Here are the steps in SLR research with PRISMA guidelines:

Search Strategy

Several articles from Google Scholar will be used as the analytical study for the research using the Systematic Literature Review (SLR) research method with PRISMA through the four primary steps of identification, screening, eligibility, and inclusion. At

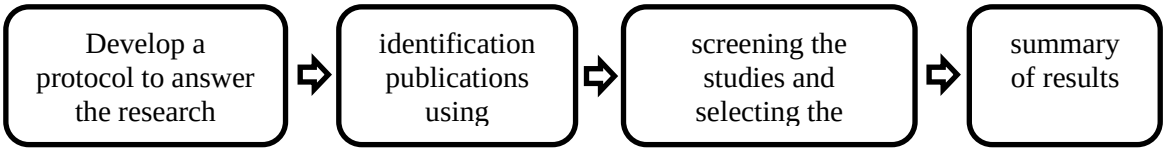

Figure 1. Four steps of SLR methodology

the identification phase, relevant articles will be collected based on predetermined keywords, as well as previously established inclusion and exclusion criteria. The keywords that were established are e-modules, flipbooks, student creativity, IPAS, teaching materials that have been searched on the PoP page integrated with Google Scholar, with searches consisting of research articles and papers that are open access. After that, in the screening phase, these articles will be further selected by reading the abstracts and content to ensure their relevance and quality. This process begins with selection. The selected publication years span 5 years from 2020 to 2024, with the aim of ensuring that the articles found are up-to-date in line with developments in IPAS learning in elementary schools. After the screening process, the feasibility stage is conducted to determine whether the articles meet the established research criteria. Articles that do not meet the criteria will be removed from the list. Finally, at the inclusion stage, the selected articles will be analyzed in more depth to obtain findings that can contribute to the development of e-modules and flipbooks in IPAS learning.

With this approach, it is intended that the study will yield a thorough analysis of how employing flipbooks and e-modules affects students' creativity within the framework of elementary school education. It is anticipated that the findings of this study will provide educators useful suggestions for creating more creative and successful instructional materials. The articles to be reviewed are chosen using the PRISMA flow diagram. The process of selecting articles to be reviewed in this study is carried out by following the PRISMA stages, as shown in the following image.

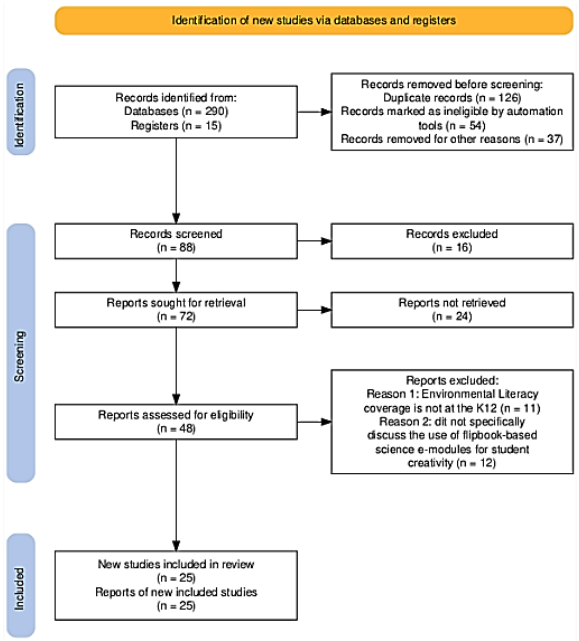

Figure 2. PRISMA selection

Inclusion and Exclusion Criteria

There are 290 papers in the Google Scholar results, and the researcher has carefully chosen 15 of them from web searches that contain the given keywords. As a result, 305 articles total were obtained. The initial screening was then carried out using a number of criteria, including (1) data inconsistency with the research, (2) open access, (3) not using English. Thus, 88 articles were obtained following the initial screening. A second screening of the remaining papers was carried out using the parameters of a five-year publication range, namely the most recent five years from 2020 to 2024. Seventy-two articles remained after this second filtering step. A third screening was carried out up until that point, using the criterion that the study did not adhere to the necessary methodological standards. 48 items in all were obtained from this screening. Several of the 48 articles were still eliminated according to the following criteria: (1) the articles reviewed are at the K12 level (from elementary to high school), so university levels are not included, (2) do not specifically discuss the use of flipbook-based IPAS e-modules that can enhance student creativity. This stage final screening, resulting in 25 selected articles for review.

Data Analysis

After obtaining 25 articles that were reviewed and met the inclusion and exclusion criteria, the articles were analyzed. Until then, a final report was prepared. The final report follows the PRISMA guidelines in this research from the website, which consists of the following checklist: (1) title, which in this article is Implementation of Flipbook-Based IPAS E-Module to Enhance Student Creativity: Literature Review; (2) abstract, consisting of background, methods, results, and conclusions from the analyzed literature search; (3) introduction, this section contains the purpose of conducting the literature review, which is to determine whether the use of flipbook-based IPAS e-modules can enhance creativity in elementary school students; (4) methods, this point contains information about how the literature search process is conducted, what sources and criteria serve as article filters, and the number of articles that will be analyzed. At this point, article identification is also done using the PoP application integrated with Google Scholar, after which the found articles are filtered using keywords. (5) results, from the selection of relevant articles, 25 articles were obtained for analysis that discuss the use of flipbook-based IPAS e-modules that can enhance students' creativity; (6) discussions, this point contains reviews of each analyzed article, the results of the search for previously conducted research articles; (7) conclusions, this point is the conclusion of the scientific articles that have been analyzed and reviewed.

▪ RESULT AND DISSCUSSION

Descriptive analysis and theme identification will be presented using the SLR method with the PRISMA model as follows.

Descriptive Analysis

Three graphs showing the distribution of literature based on year, journal quality, and research subject will be provided to illustrate the findings from the article search. Recent research shows a significant upward trend in the use of flipbook media as a learning tool, starting from 2020 to 2021. In the years 2020 to 2021, the number of studies focusing on flipbook media was still relatively low, with few studies matching the searched keywords. However, entering the year 2022, there was an increase in research

where the number of studies on flipbook media doubled compared to the previous year. The year 2023 marked the peak of this trend, with numerous studies exploring flipbook e-modules, indicating high interest from practitioners and educators. Although this trend continues into 2024, the scope of research is becoming more in-depth and specific, so some studies may no longer be relevant to the established keywords. This reflects positive developments in the utilization of innovative and interactive learning technologies in the field of education. This statement can be seen in the following diagram in Figure 3:

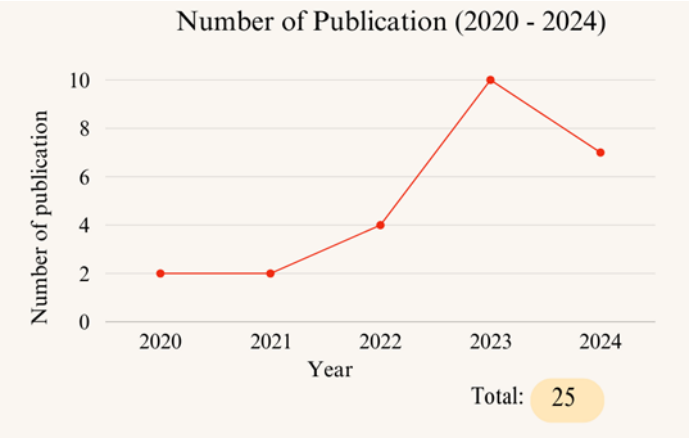

Figure 3. Number of publications (2020 – 2024)

Next, the journals found in this research are classified based on their quality, ranging from quality journals to high-quality journals, through a meticulous publication search filtering process. High-quality journals, which fall into the Scopus category, are international publications that have been accredited and globally recognized, thus making significant contributions to the development of science and best practices in their field. On the other hand, journals classified as quality, such as those equivalent to SINTA 3, are generally national publications that also have good quality standards, although they are not on par with international journals. This classification is important to ensure that the information and findings obtained from this research come from sources that are trustworthy and have a good reputation in the academic community. Thus, the selection of journals based on their quality not only enhances the validity of the research results but also provides a clearer picture of the latest trends and developments in the study of flipbook media and e-modules. This statement can be seen in the following table 1.

Tabel 1. Journal quality list

High Quality	Quality
Journal of Education and Learning (edulearn)	Journal Sainsmat
Journal Qalamuna	Elementary School Teacher
JPPIPA	Bio Edu
International Conference on Education Innovation and Social Science	Journal Periodical Scientific Physics Education
Qalamuna	ETJ: Educational Technology Journal
International Journal of Social Learning	Edunesia : Jurnal Educational Scientific

International Journal of Economics, Science, and Education	Journal of Educational Sciences
International Journal of Educational Sciences and Development	Journal Scientific of Basic Education
IJORER : International Journal of Recent Educational Research	Journal Pendidikan Dasar Indonesia
Journal of Physics: Conference Series	Journal Basicedu
International Journal of Multicultural and Multireligious Understanding	
Journal Prima Edukasia	
Journal Sains and Teknologi	
Journal of Educational Science Research	

The next stage in this research is to categorize the journals that have been found based on relevant research subjects. This grouping process is carried out meticulously to ensure that the research focus remains intact and aligned with the desired context. In this case, the research subjects are limited to the K12 level, which includes elementary to high school ages. This limitation is important to provide clarity and consistency in the analysis, so that all studies analyzed can contribute to a better understanding of the application of flipbook media in the K12 education context. By limiting the research subjects to this age group, researchers can more easily identify trends, challenges, and opportunities in the use of flipbook media as a learning tool across various educational levels. In addition, grouping based on this subject also allows researchers to explore the differences and similarities in the approaches used at each educational level, thereby providing more specific and applicable recommendations for educators and curriculum developers. Through this step, it is hoped that the research can make a meaningful contribution to the development of innovative learning methods that meet the needs of students in the current digital era. This statement can be seen in the following diagram:

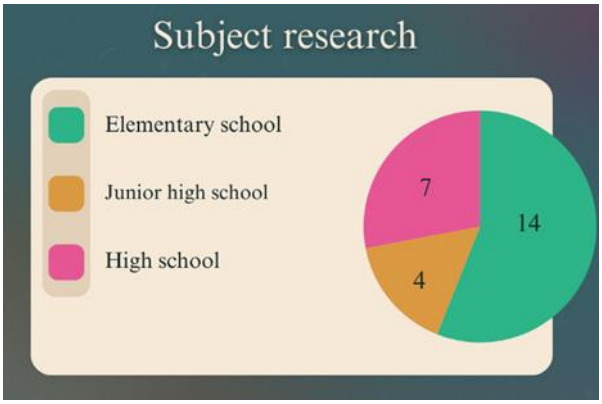

Figure 4. Subject research

Thematic Analysis

From the results of the identification using SLR, this research has 3 research questions that will be discussed, namely: (1) How can flipbooks be effectively integrated by teachers into the independent curriculum as teaching materials for IPAS subjects; (2)

How can the effectiveness of this flipbook vary according to the context and characteristics of the students so that student creativity increases and the expected IPAS learning outcomes are achieved.

RQ 1: How can flipbooks be effectively integrated by teachers into the Merdeka curriculum as teaching materials for IPAS subjects?

Based on the first research question, which is how flipbooks can be used by teachers to interact effectively within the Merdeka Curriculum as an introductory material for Natural and Social Sciences (IPAS) lessons, this analysis can be divided into two relevant subtopics: 1) the effectiveness of using flipbooks as teaching materials for Science and Social Studies (IPAS) in the Merdeka Curriculum; 2) the effectiveness of using flipbooks as teaching materials for IPAS at the elementary school level.

Theme 1: The effectiveness of flipbooks used as teaching materials for IPAS in the independent curriculum

The effectiveness of using flipbooks as teaching materials in Natural and Social Sciences (IPAS) within the context of the Merdeka Curriculum has been proven through various studies that show an improvement in student learning outcomes. This can be seen in the analysis results from several selected studies. The results of the analysis can be seen in the following table 2.

Table 2. Results of the SLR (systematic literature review) analysis

No.	Authors	Research method	Subject research	Year of Publication	Final result
1.	Bunari et al.,	Regression method with a quantitative approach	Class VIII	2023	The use of flipbook learning media, the increase in learning interest, and the strengthening of learning motivation can support each other to achieve optimal learning outcomes for students.
2.	Fitriyah & Sahda	Research and Development (R&D) model ADDIE	Class VII	2023	The discovery of a flipbook e-module product based on valid, practical, and effective learning to enhance student motivation and achieve learning outcomes
3.	Ikram	Quantitative with a quasi-experimental design	Class VIII	2024	The flipbook-based learning method in a blended learning model significantly improves students' learning outcomes compared to traditional methods.
4.	Aisyah & Mustaji	qualitative and quantitative	Class X	2023	The motivation results of the students achieved 82% of the overall average of all students. This indicates that the use of

					Flipbook media for student motivation can improve in learning activities, thereby also enhancing students' learning outcomes.
5.	Leny et al.,	Research and Development (R&D) model ADDIE	Class X	2021	In the limited trial class, the achievement of knowledge and attitude learning with N-gain scores between pretest and posttest increased, and it was concluded that the use of flipbook media resulted in an improvement in student learning completeness as expected, and the average score increased after the application of the flipbook media.
6.	Situmorang et al.,	Research and Development (R&D) model ADDIE	Class XI	2020	Electronic module with flipbook maker Kvisoft is suitable for use as teaching material and can be tested in direct learning, and the results are very valid.
7.	Zaman et al.,	Research and Development (R&D)	Vocational High School	2024	The e-module that uses an audio-visual flipbook as its basis can be used as a more in-depth teaching aid for arithmetic learning, including a ledger that has been proven valid. This e-module is engaging, interactive, and helps motivate students to learn.
8.	Zaniyati & Rohmani,	qualitative and quantitative	Class X	2024	The results of the research on media and material validation, as well as testing in large and small groups, resulted in a very feasible category. Thus, the motivation results of the students increased. This indicates that the presence of Flipbook media can motivate students and improve their learning outcomes.

In the context of the Merdeka Curriculum, flipbooks offer an innovative approach that allows students to learn in a more interactive and engaging way. Based on the research conducted by (Bunari et al., 2024), the use of flipbook learning media for increasing learning interest and strengthening learning motivation can mutually support

each other to achieve optimal learning outcomes for students. From the data collection conducted through interviews, observations, and documentation. Prerequisite analysis tests include normality, multicollinearity, and heteroscedasticity tests. Hypothesis testing used simple regression and multiple regression. The research results show that there is an influence: a) the flipbook learning media on learning outcomes with a t-value of 73.33, a significance value of 0.000 < 0.005, b) learning interest on learning outcomes with a t-value of 33.678, a significance value of 0.000 < 0.005, c) learning motivation on learning outcomes with a t-value of 30.678, a significance value of 0.000 < 0.005, and d) the flipbook learning media, learning interest, and learning motivation together on learning outcomes with an F-value of 47.879 > F table 2.77 with a significance of 0.000 < 0.005. Thus, it can be concluded that in this study, the use of flipbook learning media, the enhancement of learning interest, and the strengthening of learning motivation can mutually support each other to achieve optimal learning outcomes for students.

According to (Leny et al., 2021) in their research, the data produced indicate that (a) the Problem-Based Learning (PBL) flipbook e-module on redox material developed is very valid. In terms of content, it scored 91% (very feasible), presentation 96% (very feasible), language 95% (very feasible), and media 94.5% (very feasible); (b) the Problem-Based Learning (PBL) flipbook e-module model on redox material has met the practical category with an average individual test score of 3.5 (good), small group test 3.4 (good), student response questionnaire 3.3 (good), and teacher's teaching activity using the e-module 3.6 (good); (c) the Problem-Based Learning (PBL) flipbook e-module model on redox material has met the effective criteria. In the limited trial class, the knowledge learning achievement with an N-gain score between the pretest and posttest was 0.80 (high), and the attitude learning achievement was 83.26. Therefore, it is concluded that the use of flipbook media results in an increase in student learning completeness as expected, and the average score improved after the implementation of the flipbook media.

Thus, the integration of flipbooks into the Merdeka Curriculum as teaching materials for IPAS can have a significantly positive impact on student motivation and learning outcomes, making it a highly valuable tool in modern education. The use of flipbooks not only enriches students' learning experiences but also supports a more inclusive and adaptive learning approach. In this context, flipbooks enable teachers to present material in a more contextual and relevant manner, allowing students to relate their learning to their daily lives. Overall, the integration of flipbooks in the Merdeka Curriculum offers great potential to revolutionize classroom learning, making it more engaging and effective. With the right support from teachers and educational institutions, flipbooks can become one of the innovative solutions in improving the quality of education in Indonesia.

Theme 2: The effectiveness of flipbooks used as teaching materials for IPAS at the elementary school level.

The effectiveness of using flipbooks as teaching materials in Natural and Social Sciences (IPAS) at the elementary school level has proven to have a significantly positive impact on the learning process. Flipbook, which is an interactive learning medium, allows students to access information in a more engaging and enjoyable way. Research shows that the use of flipbooks can enhance students' conceptual understanding, as the material

is presented in a more visual and easily comprehensible format. The results of the analysis can be seen in the following table 3.

Table 3. Results of the SLR (systematic literature review) analysis

No.	Authors	Research method	Subject research	Year of Publication	Final result
9.	Hasanah & Sari,	Research & Development (R&D) quantitative method	Class IV	2024	The development of flipbook-based e-modules as teaching materials for science on the topic of force is highly valid according to media experts, material experts, and language experts. The flipbook e-module presented in an engaging manner for fourth grade can enhance intrinsic learning motivation.
10.	Fitriasih & Wulandari	Research & Development (R&D) quantitative method	Class IV	2023	This research indicates that flipbook-based learning media is very feasible to use, resulting in improved science learning outcomes for the 4th-grade students of SD Negeri Tambakaji 02 Semarang.
11.	Wuryandani,	quantitative with survey research and qualitative descriptive types	Class IV	2024	The research results show that 100% of teachers need interactive flipbook-based teaching materials for elementary school students. These teaching materials are considered the most appropriate and effective solution to meet the learning needs.
12.	Putra et al.,	Research and Development (R&D) model ADDIE	elementary school	2023	This flipbook teaching material is very suitable to be applied as a digital-based teaching material in the Pancasila student profile strengthening project in elementary schools because it is presented in an engaging and creative manner.
13.	Endaryati et al.,	SLR method	elementary school	2023	E-module flipbooks can be used effectively to enhance critical thinking skills if

	integrated with innovative learning models such as Problem-Based Learning.

The effectiveness of using flipbooks as teaching materials for IPAS at the elementary school level has been proven, as flipbooks are fun and engaging learning media, making elementary school students enthusiastic about using flipbooks for learning. With its interactive design and appealing visuals, the flipbook is able to capture students' attention and make them more engaged in the learning process. Students can easily switch between pages, explore the content, and interact with the existing multimedia elements, such as images, videos, and animations. This not only makes learning more enjoyable but also helps students understand concepts that might be difficult if conveyed through traditional methods.

Based on the research conducted by (Hasanah & Sari, 2024), the use of flipbook media shows that the Flipbook E-module on IPA force material is considered valid and capable of encouraging students' interest in independent learning activities. This can be seen from the media expert obtaining a validation score of 95% (Very Valid), from the material expert with a score of 87.50% (Very Valid). Very valid and the percentage score of the language expert validator is 94%. Very valid. The development of the e-module created by the researchers also proves an increase in students' interest in self-directed learning because the flipbook teaching materials are made engaging, allowing students to explore the material at their own pace and learning style, which is very important in supporting the diversity of learning methods in the classroom. Research shows that when students feel more engaged and have control over their learning process, their intrinsic motivation to learn also increases.

According to(Wuryandani, 2024), it is emphasized that flipbook-based teaching materials provide resources that are not only aligned with the curriculum but also capable of captivating students' interest and facilitating a deeper understanding of the content. Modern interactive materials such as flipbooks can offer a more dynamic learning environment, helping students better understand complex concepts through engaging and visually stimulating content. The integration of flipbooks into the IPAS curriculum allows teachers to adopt a more creative and innovative approach to learning. Teachers can design activities that involve students in creating their own flipbooks, thereby encouraging collaboration and creativity. Activities like this not only strengthen students' understanding of the material being taught but also develop critical thinking and problem-solving skills. With all these advantages, it is clear that flipbooks are a very effective tool in improving the quality of education at the elementary school level, making them the right choice to support the implementation of the Merdeka Curriculum.

RQ 2: How can the effectiveness of this flipbook vary according to the context and characteristics of the students so that student creativity increases and the expected IPAS learning outcomes are achieved?

Based on the second research question, namely How the effectiveness of this flipbook can vary according to the context and characteristics of the students so that student creativity increases and the expected IPAS learning outcomes are achieved, this analysis can be divided into two relevant subtopics, namely: 1) The effectiveness of the

flipbook as an IPAS teaching material used in elementary schools, especially in 5th grade; 2) The effectiveness of the flipbook used as an IPAS teaching material so that creativity increases.

Theme 1: The effectiveness of flipbooks as teaching materials for IPAS used in elementary schools, especially in 5th grade

The effectiveness of flipbooks as teaching materials for IPAS used in elementary schools, especially in the 5th grade, has shown promising results in improving students' understanding and engagement. With its interactive and visual characteristics, the flipbook is able to present lesson materials in a more engaging way, thereby motivating students to learn more. In 5th grade, where students begin to learn more complex concepts in IPAS, the use of flipbooks becomes very relevant. This media allows students to explore various topics, such as ecosystems, weather changes, and natural resources, in a fun and easy-to-understand way. Here are the results of the journal analysis that have been established, as shown in the following table 4:

Table 4. Results of the SLR (systematic literature review) analysis

No.	Authors	Research method	Subject research	Year of Publication	Final result
14.	L. Novitasari et al.	Experiment with Quasi Experimental Design	Class V	2023	With flipbook media, students are directly involved in the learning process, allowing them to experience a more interactive and enjoyable learning experience.
15.	Aprilia,	Experiment with a true-experimental design	Class V	2021	Contextual-based science flipbook media is deemed suitable and effective for use in elementary school science education and is capable of enhancing students' critical thinking skills.
16.	Nurhayati & Langlang Handayani	Qualitative descriptive	Class V	2024	The use of interactive flipbooks, aided by audio and visuals, is considered suitable and engaging for students to learn while playing.
17.	Damayanti et al.	Research and Development (R&D)	Class V	2023	The development of flipbook-based e-book teaching materials is suitable for use in the learning process in the 5th-grade class at SDN Menteng, subtheme 2 on environmental changes.

From the research results, it shows that students, especially in the 5th grade, who use flipbooks as teaching materials tend to participate and interact more actively. In addition, flipbooks also support independent learning, where students can access information anytime and anywhere, allowing them to learn at their own pace according to their individual characteristics. According to (L. Novitasari et al., 2023), the implementation of the 5th-grade IPAS module oriented towards ethnoscience has an impact on the creativity of students in the independent curriculum. This is consistent with the data calculation results, where the Sig. (2-tailed) value is 0.000 < 0.05, thus it can be concluded that there is a difference in the creativity of elementary school students in the independent curriculum after using the Ethnoscience-Oriented IPAS Module. This difference tends to show a significant increase using flipbook-based teaching materials.

According to (Damayanti et al., 2023), flipbook-based E-book teaching materials are suitable for use as a varied, creative, and innovative learning medium on the theme of environmental changes in the fifth grade at SDN Menteng. Based on the available data, the flipbook-based E-book that has been developed and tested through media expert validation with a score of 97.33% is categorized as very feasible, language expert validation at 94.54% is declared very feasible, and material expert validation at 92% is categorized as very feasible, with an N-Gain result of 0.72, meaning that students can follow and complete the learning process well. Thus, the flipbook as a tool is very effective in supporting IPAS learning in the 5th grade, in line with the goals of the Merdeka Curriculum which emphasizes student-centered learning and character development. With this approach, students not only become recipients of information but also actively engage in the learning process, allowing them to explore and understand IPAS concepts more deeply. Flipbooks encourage students to be active because they can directly interact with the content, conduct analyses, and develop their own understanding of the material being studied. Additionally, the use of flipbooks also provides teachers with the opportunity to adapt their teaching methods according to the needs and interests of the students, creating a more inclusive and responsive learning environment.

Theme 2: The effectiveness of flipbooks used as teaching materials in IPAS increases creativity.

The effectiveness of the flipbook as an open IPAS material has not only been proven to enhance students' understanding but also significantly boost their creativity. With its interactive and visual format, the flipbook encourages students to think beyond traditional boundaries in learning. Students do not just passively receive information, but they are invited to actively participate in the learning process, such as creating content, designing pages, and adding relevant multimedia elements. These activities stimulate students' imagination and creativity, allowing them to express their understanding of the material in a unique and personal way. The results of the established journal analysis can be seen in the following table 5:

Table 5. Results of the SLR (systematic literature review) analysis

No.	Authors	Research method	Subject research	Year of Publication	Final result
18.	Elisya et al.,	Quantitative with a One	Class VII	2023	From the data, it shows that teaching materials

		Group Pre-Test and Post-Test Design			using flipbook-based e-modules are proven to be effective in enhancing students' creative thinking skills in science subjects, particularly in the topic of motion and force.
19.	Ningrum et al.,	4-D (Define, Design, Development& Disseminate) without dissemination	Class X	2022	The research results show that the validity of the Animalia E-Module is very practical and suitable for use in learning, and it can enhance students' creativity.
20.	Aji et al.,	quantitative and qualitative data analysis	Class VI	2022	The development of a flipbook-based science e-module to achieve the Sustainable Development Goals (SDGs) for elementary school students is feasible and can be used in the learning process.
21.	Rohmatin et al.,	descriptive qualitative with non-probability sampling technique	Class X	2022	From the results of the independent t-test research, the experimental class experienced an improvement using the flipbook-based e-module, and this shows that the average response in education is suitable for use in critical thinking skills.
22.	Lakapu et al.,	classroom action research	elementary school	2023	In cycle II, the children's regularity in learning using flipbook learning media to improve their learning outcomes on climate change material showed an increase compared to cycle I.
23.	Pakpahan et al.,	Research & Development (R&D)	Class VI	2022	The Earth and Universe material e-module based on a flipbook is categorized as very valid and can be used for science education.

24.	Putri et al.,	Research & Development (R&D)	Class IV	2024	Flipbook-based e-modules are very practical and easy to use for learning, and they can also increase students' interest in reading.
25.	Triwahyuningtyas et al.,	Research and Development (R&D) model ADDIE	Class III	2020	The flipbook e-module is able to encourage students to think critically, thereby enhancing their creativity.

From the research results, the use of flipbooks allows students to collaborate on creative projects, where they can work together in groups to produce flipbooks that reflect their collective understanding of a particular topic. This process not only enhances communication and collaboration skills but also provides space for students to share ideas and perspectives with each other. Research shows that a learning environment that supports creativity can enhance student motivation and help them develop critical thinking skills necessary for solving real-world problems. According to (Triwahyuningtyas et al., 2020), the problem-based learning (PBL) e-module developed using KVISFOT Flipbook Maker is valid with an average score of 85.82%. Meanwhile, the response category results indicate that the problem-based learning (PBL) e-module developed using KVISFOT Flipbook Maker is good with an average score of 3.78. Next, the average effectiveness test score using the evaluation test for third-grade students was 90.47. Thus, it can be concluded that the flipbook e-module is capable of encouraging students to think critically because they can directly interact with the content, conduct analyses, and develop their own understanding of the material being studied. Critical thinking skills are necessary for solving real-world problems. Thus, the integration of flipbooks in IPAS learning not only enriches students' learning experiences but also contributes to the development of creative skills that are essential for their readiness to face future challenges.

According to (M. Ningrum et al., 2023), the flipbook-based Animalia E-Module is very valid with an overall score of 100%. From the results of the observation of the implementation of learning using the flipbook, a score of 100% was obtained, which means the flipbook was utilized very effectively. Additionally, the response rates from teachers and students were 96% and 95%, respectively. Thus, the Animalia E-Module is very valid and practical, making it suitable for use in teaching and capable of enhancing students' creativity.

By presenting lesson materials in an interactive and engaging format, flipbooks invite students not only to receive information but also to disseminate, spread, and integrate the knowledge they acquire. Students are encouraged to understand the concepts being taught, seek connections between various pieces of information, and apply that knowledge in different contexts. This critical thinking process is very important in IPAS learning, where students need to understand natural and social phenomena in depth.

In addition, the challenges presented in the flipbook e-modules often require students to design creative solutions to the problems faced. For example, when studying the impact of environmental changes, students can be asked to create projects or presentations that illustrate innovative solutions to address the issue. Activities like this

not only enhance critical thinking skills but also provide students with the opportunity to express their ideas creatively. Thus, the flipbook e-module serves as an effective tool in creating a dynamic and inspiring learning environment, where students feel motivated to think more deeply and innovate. This, in turn, contributes to the development of 21st-century skills that are highly needed in a constantly changing world.

According to (Lestari, Y., A, 2020), there is a strong connection between students and learning materials, so students can be said to truly understand and master the subjects being taught. Delivering material by creatively packaging learning materials certainly requires a distinct approach. Teaching materials packaged online in the form of flipbook-based e-modules have become one of the alternatives. The use of flipbook-based IPAS teaching materials provides a strong motivation for students to learn, as evidenced by several studies showing that flipbooks can enhance learning enthusiasm, creativity, and student learning outcomes. According to (Pawartani et al., 2024), the use of appropriate teaching materials can enhance students' creativity. The appropriate teaching materials make learning engaging and help reduce conceptual errors and student confusion. Flipbook-based e-module teaching materials become interesting and enjoyable because students can access them independently, and they are accompanied by animations and videos that are certainly enjoyable for students. Illustrations and simple, contextual narratives, engaging student activities, and in-depth material through various video sources make the flipbook-based e-modules more vibrant and appealing as teaching materials for science, thereby enhancing student engagement in the learning process. In addition, the flipbook-based IPAS teaching materials are holistically designed to support the process of knowledge construction for students, where students not only understand the concepts of natural phenomena but also connect them with the environmental aspects of their surrounding community. Thus, the IPAS flipbook is not just an innovative and engaging teaching material, but it can also foster students' motivation and creativity, ensuring that the learning outcomes of IPAS meet the established learning objectives.

Based on the journal (Fitriasih & Wulandari, 2023), flipbooks are considered effective as teaching materials in IPAS subjects because they are believed to enhance learning outcomes. Where it can serve as a comprehensive source of information for students. Flipbook helps students to become interested and deepen their understanding of the material as well as their direct learning experience. In addition, the flipbook teaching materials service makes it easier for students to access them anytime and anywhere. The display not only includes descriptions of IPAS material but also various features such as animations, audio, and videos accompanied by illustrations, making the flipbook engaging and enjoyable. If the flipbook is used as an educational process, it will lighten the teacher's task in delivering lesson material. From the results of the literature review analysis that has been presented, it is mentioned that flipbooks can make it easier for teachers to deliver the material to be taught in the learning process, so that students become more creative in studying the concepts of natural phenomena that occur and relate them to the community environment. Flipbook is also easy to use and accessible to anyone because it is designed like sheets of a book. We just need to open and click on what we want by simply touching the screen. From the research results, the flipbook-based IPAS e-module is an engaging and enjoyable teaching material that can motivate students to learn, making them active and enhancing their creativity. The use of the flipbook-based IPAS e-module is considered very effective when used in the learning process.

▪ CONCLUSION

Flipbook is one of the innovative and interesting platforms used as learning materials and is considered effective for delivering content to students. With all the benefits obtained and its ease of use, the teaching material in the form of IPAS e-modules based on flipbooks offers practicality. Considering the abstract and complex characteristics of the IPAS subject, which must integrate natural phenomena with the state of the community environment, the use of flipbooks makes it easier for students to understand and learn the concepts, thereby creating meaningful experiences in the learning process.

The use of flipbook-based IPAS e-module teaching materials has been proven to enhance learning motivation, student engagement in the learning process, thereby increasing student creativity and achieving the desired learning outcomes.

This scientific article still needs to be developed with the aim of becoming a good reference for teachers in determining innovative teaching materials and keeping up with the times, thereby activating the role of students in the classroom.

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