

34. Developing flash flipbook as a learning resource to improve.pdf

by specialgra2025_4 specialgra2025_4

Submission date: 27-Jul-2025 06:25PM (UTC+0300)

Submission ID: 2710364954

File name: 34_Developing_flash_flipbook_as_a_learning_resource_to_improve.pdf (637.1K)

Word count: 6089

Character count: 33567

Developing flash flipbook as a learning resource to improve students' digital literacy in elementary school

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Received: 19 November 2024

Revised: 16 April 2025

Accepted: 3 May 2025

Published: 16 May 2025



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Abstract: Learning resources in primary schools have not fully utilized digital technology. Effective learning resources can increase students' knowledge and learning activities. This research aims to produce learning resources in the form of flash flipbooks that are valid, practical, and effective for improving digital literacy of elementary school students. The research method used is Research and Development (R&D) by applying the ADDIE model (analysis, design, development, implementation, and evaluation). The subjects of this study were fourth grade students in the 2023/2024 school year as many as 27 students. Data were collected through interviews, product validation questionnaires, student response questionnaires, and digital literacy tests. The results showed that flash flipbooks are very valid for use in learning in elementary schools after going through a validation process by media experts, material experts, and practitioners. One to one and small group trials show that flash flipbooks are very practical to use. In addition, the results of the field trial showed an increase in digital literacy with a moderate category. Overall, flash flipbook products can be used in learning with a very feasible, practical category, and can improve digital literacy of elementary school students.**Keywords:** Digital literacy; flash flipbook; learning resources

1. Introduction

Digital literacy has become a key competency that individuals must possess in today's rapidly evolving digital era, both globally and nationally. Globally, many countries have integrated digital literacy into their formal education systems as a response to ongoing digital transformation (Kateryna et al., 2020; Neag et al., 2025). In Indonesia, although the use of digital technology is increasing, challenges in digital literacy remain, such as unequal access to technology, limited critical understanding of digital information, and the suboptimal integration of digital media into the learning process (Latip et al., 2022). Digital literacy not only involves technical skills in operating digital devices, but also includes critical thinking, ethical use of technology, and productive application of digital tools in various aspects of life, particularly education. The advancement from the Industrial Revolution 4.0 to the 5.0 era has further reinforced the role of digital literacy in education. The 5.0 era emphasizes the collaboration between humans and technology to create more personal and meaningful value, especially in the context of learning (Rojas et al., 2021). This shift has not only affected teaching methods but has also reshaped the fundamental concept of education itself. Teachers and students are now required to master technology as part of efforts to improve the quality of learning (Garcia et al., 2023; Hasibuan & Chairad, 2023). The use of technology as a learning resource, support tool, or intermediary in the learning process is seen as a strategic step to create effective and efficient learning experiences and to help achieve learning objectives (Permata & Khusniyah, 2022; Pulungan et al., 2022).

However, the integration of technology into education also presents specific challenges, such as the underutilization of digital tools and the ambiguity surrounding their role in learning (Feng & Liu, 2024). The integration of digital technology in learning

media not only supports students' understanding of energy literacy materials, but also makes a positive contribution to the development of digital literacy through interactive and contextual activities (Suratmi et al., 2025). On the other hand, technology holds great potential to foster 21st-century skills such as collaboration, critical thinking, creativity, and innovation (Baek et al., 2024; González-Salamanca et al., 2020). Therefore, strengthening digital literacy is essential to ensure that students use technology wisely and productively. Digital literacy not only helps students utilize technological devices and internet networks for learning but also enhances their ability to critically engage with the digital information they encounter (Belmonte et al., 2024; Nurzhanova et al., 2023). In this context, teachers play a crucial role in selecting and managing appropriate learning resources that align with technological developments. Choosing relevant learning resources allows teachers to use their time more effectively and supports students' academic achievement (Nariswari et al., 2022). As stated by Anjarwati (2019) and Saro et al (2023), learning resources include all forms of information, individuals, and various other media that can be used in the learning process, both individually and in groups. Literacy skills have a direct impact on teachers' competence in designing lesson plans. Teachers with strong literacy abilities are more likely to create instructional plans that are targeted and aligned with the demands of the digital era. Therefore, efforts to improve literacy should focus on developing models that are contextual and responsive to local conditions and students' needs (Suratmi et al., 2025).

Based on the results of an interview with one of the fourth grade teachers of a public elementary school in Palembang, Indonesia, It was found that students had begun to explore learning resources beyond printed books, indicating a shift in their preferences. This change may be driven by the fact that relying solely on printed materials can lead to boredom or decreased engagement in the learning process. As an alternative, teachers use smartphone media and learning videos from YouTube to increase student interest in class. However, innovation is needed in developing other learning resources. One of the proposed solutions is to use flash flipbooks. The selection of flash flipbooks as a learning resource was chosen because it is still rarely known by some teachers, but has the potential to motivate students in the learning process. This innovation is expected to improve the quality of learning and learning interest of students in grade IV of a public elementary school in Palembang. Flash flipbooks are considered a medium that is easy for students to understand, especially to increase the level of activity and make learning more interesting and memorable, especially at the elementary school level. Flash flipbooks are included in the category of slide sound media which is a form of audio-visual media (Amanullah, 2020). In addition, flash flipbooks can also be used as learning resources because they present learning materials in a format that includes text and images, with a design that is attractive to students. The use of flash flipbooks is expected to make it easier for students to understand and master the lessons (Haryanti, 2023). Thus, flash flipbooks are an effective choice to increase student interactivity and understanding in the learning process.

According to research by Landina and Agustiana (2022), the developed flash flipbook was considered feasible and valid for learning. The results of this study support the effectiveness of flash flipbooks as a learning resource with high validity and qualifications from various parties involved. Based on research by Martatiana et al., (2022), flash flipbooks as teaching materials that have been tested, are interesting, and very feasible to use in learning. Validity was tested by material experts, language experts, and media experts, and involved 29 fourth grade students of SEMPLAK Elementary School. Media expert validation showed an agreement rate of 92.50%, while language expert validation reached 90.90%, indicating good language suitability. Material expert validation gave an agreement of 92.30%. Student responses showed that 81.38% felt that the teaching materials were easy to use, interesting, and helpful in learning. These results support that flash flipbooks are a good choice to support student learning.

In accordance with the findings of previous studies, similar results were reported by Putra et al (2023), who found that the use of digital flash flipbook-based learning media

had a positive impact on students' achievement of minimum competency standards. A total of 92.68% of students met the standard, a significant increase from the previous 53.66%. Questionnaire results also indicated that students found the media effective, with an average approval score of 65.12%. The N-Gain test results showed an average score of 0.57, categorized as moderate, while 57.21% of students demonstrated improved understanding and achievement through the use of flash flipbooks. These findings reinforce the effectiveness of flash flipbooks in supporting student learning outcomes. Previous developments of flash flipbooks have mainly focused on enhancing critical thinking, general learning effectiveness, and conceptual understanding among elementary school students.

However, what differentiates this study from prior research is its specific focus on using flash flipbooks as a tool to improve students' digital literacy. While previous studies emphasize cognitive outcomes such as comprehension and critical thinking, this research aims to explore how interactive media like flash flipbooks can serve not only as instructional tools but also as platforms to develop students' ability to navigate, evaluate, and utilize digital content effectively. This clear shift in focus addresses a critical and timely need in education, especially in the context of increasing digitalization in the classroom. Therefore, the development of a flash flipbook in this study introduces a novel perspective by aligning the use of media with the broader goal of strengthening digital literacy—a dimension that has not been extensively explored in earlier research. The objectives of this study include designing a digital flash flipbook as a learning resource, validating its content, assessing its practicality, and evaluating its impact on digital literacy and learning engagement among elementary school students.

2. Materials and Methods

This study uses a research and development (R&D) method with the ADDIE development model. This development model consists of five stages, namely analysis, design, development, implementation, and evaluation (Branch, 2010). The ADDIE model with research stages begins at the analysis phase, which includes media analysis, student learning style analysis, and material analysis. The analysis stage uses interview instruments. Furthermore, the design stage begins with the selection of applications, selection of materials, selection of display designs, and media assessment instruments. The development stage carried out is the development of a flash flipbook with material on changing the form of energy in the science subject. After that, the flash flipbook was validated by media and material experts, and practitioners (teachers) as well. The implementation stage is carried out with individual trials (one-on-one) and small group trials (small group). The evaluation stage is carried out using a digital literacy test which aims to determine the impact of the flash flipbook product that has been developed.

The subjects used in this study were 27 grade of IVB students from the same class, who were randomly selected for each trial group division: three students for individual trials and seven students for small group trials. After the individual trials and small group trials, a field trial was conducted involving 17 students, all from the same class. Data obtained from interviews, expert validation questionnaires, and student response questionnaires were analyzed descriptively quantitatively. The results obtained from media experts, material experts, and practitioners can use the following Formula 1 (Martatiyana et al., 2022).

$$P = \frac{\sum X}{\sum Xi} \times 100 \quad (1)$$

Description:

P = Percentage of eligibility (%)

$\sum X$ = Total number of validator scores

$\sum Xi$ = Total number of maximum scores

The results obtained from the experts were converted into percentage form with the product validity level criteria developed in [Table 1](#).

Table 1. Product validity level criteria

Average Score (%)	Category
25 – 39.9	Not Valid
40 – 54.9	Less Valid
55 – 69.9	Quite Valid
70 – 84.9	Valid
85 – 100	Very Valid

Furthermore, to find out the results of student responses, you can use simple qualitative calculations as [Formula 2](#).

$$\text{Percentage} = \frac{\text{Total score obtained}}{\text{Maximum score}} \times 100 \quad (2)$$

After getting the response results, the scores are changed into percentage form and the criteria for determining the practicality of the flash flipbook media can be seen in [Table 2](#).

Table 2. Product practicality level criteria

Average score (%)	Category
86 – 100	Very Practical
71 – 85	Practical
56 – 70	Quite Practical
41 – 55	Not Practical
20 – 40	Very Not Practical

In addition, to determine the impact of the use of flash flipbook media carried out by students in the field trial. Calculations are carried out using the N-Gain score to determine the learning outcomes of students using the developed flash flipbook media. The following is a [Formula 3](#) that will be used to calculate student results.

$$N_{\text{Gain}} = \frac{S_{\text{posttest}} - S_{\text{pretest}}}{S_{\text{Maximum}} - S_{\text{pretest}}} \quad (3)$$

The criteria for determine the impact of the use of flash flipbook media that has been carried out by students can be seen in [Table 3](#).

Table 3. Gain normality value criteria

Gain Normality Value	Criteria
$0.70 \leq n \leq 1.00$	High
$0.30 \leq n \leq 0.70$	Medium
$0.00 \leq n \leq 0.30$	Low

The categories used to determine the assessment of each component of the digital literacy indicator results are skills functional, collaboration and communication, ability to select and search for information, critical thinking and evaluation skills and to find out the results of the assessment can be seen in [Table 4](#).

Table 4. Categories assessment indicator digital literacy

Average score (%)	Category
81 – 100	Very Good
61 – 80	Good
41 – 60	Quite Good
21 – 40	Not Good
0 – 20	Very Poor

3. Results

3.1 Analysis

This stage aims to collect the required data and information. The needs analysis at this stage was conducted through an interview with one of the fourth grade teachers of a public elementary school in Palembang, Indonesia. The data and information obtained from the interview were regarding the media used by the teacher during the learning process, students' learning styles during class, and the materials to be used in the flash flipbook media. Based on the results of an interview conducted with one of the fourth grade teachers of a public elementary school in Palembang, Indonesia, namely Mrs. Rasunah, S.Pd. on September 21, 2023.

During the learning process, students shows a high activeness and enthusiasm. They are more interested in varied learning, such as the use of interactive learning media or teaching aids, which can attract their interest in learning. This is a motivation for teachers to utilize media technology in the classroom teaching process. The material used in flash flipbook media is related to changes in the form of energy taught in science subjects in grade IV SD, based on the analysis of teacher books and student books. This material is divided into three topics, namely changes in the form of energy around us, stored energy, and energy in motion. The learning outcomes for this material are that students can identify sources and forms of energy and explain the process of changing forms of energy in everyday life.

3.2 Design

This stage is the process of designing the product to be developed, namely a flash flipbook. The design process in this study consists of several stages, namely the stage of selecting an application to develop a flash flipbook using *Canva* and any flip web. The stage of selecting the material to be used is changing the form of energy in the subject of science for grade IV elementary school, and the stage of selecting the display design. The following is the sequence of the contents of the flash flipbook to be developed.

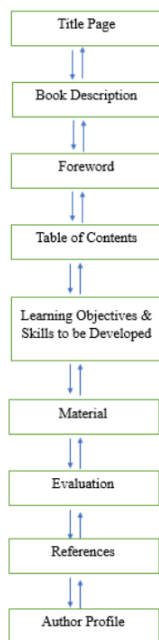


Figure 1. Flash flipbook contents sequence

3.3 Development

3.3.1 Creating Flash Flipbook Media

The development of the flash flipbook media began with designing the visual layout using the *Canva*. It was used to create engaging and visually appealing background designs that aligned with the theme and content of the science material, particularly on the topic of energy transformation. The layout included illustrations, icons, and color schemes that were carefully selected to attract students' attention and support their understanding of the concepts. After the visual components were finalized, the slides were exported and uploaded to any flip web, an online platform that transforms static pages into interactive flipbook media. This platform allowed the content to be presented in a more dynamic, book-like format, complete with page-turning animations and interactive navigation. The use of any flip helped enhance student engagement, making the learning process more immerse and enjoyable, while also supporting the goal of utilizing technology to accommodate varied learning styles.

3.3.2 Description of Media Expert Validation Results

This study requested assistance from a media validator, namely Dr. Erna Retna Safitri, M.Pd. who is a lecturer at the Elementary School Teacher Education Department, Faculty of Teacher Training and Education, Sriwijaya University. Table 5 presents the results of product validation by media experts.

Table 5. Media expert validation results

Aspect	Maximum Score	Score Achieved	Percentage (%)	Category
Appearance	24	22	92	Very Valid
Operation	16	15	94	Very Valid
Total	40	37	93	Very Valid

The results of the assessment by the media expert validator on the flash flipbook reached an overall score of 37, with a maximum score of 40. Thus, a validation value from the media expert of 93% was obtained, which is included in the very valid category.

3.3.3 Description of Material Expert Validation Results

The validation of the material expert in this study was carried out by the science material expert validator, Mrs. Dwi Cahaya Nurani, M.Pd. who is one of the lecturers in the Elementary School Teacher Education Department, Faculty of Teacher Training and Education, Sriwijaya University. Table 6 presents the results of product validation by material experts.

Table 6. The material experts' validation results

Aspect	Maximum Score	Score Achieved	Percentage (%)	Category
Content Eligibility	20	19	95	Very Valid
Linguistics	20	19	95	Very Valid
Evaluation	8	8	100	Very Valid
Total	48	46	96	Very Valid

The assessment results from the material expert validator reached an overall score of 46, with a maximum score of 48. Thus, a validation score from the material expert of 96% was obtained, which is included in the very valid category.

3.3.4 Practitioner Validation Results Description

In addition to conducting validation with media experts and material experts, validation was also conducted by practitioners, namely one of the fourth grade teachers of a public elementary school in Palembang, Indonesia, by Mrs. Rasunah, S.Pd. Table 7 presents the results of product validation by practitioners.

Table 7. Validation results by practitioners

Aspect	Maximum Score	Score Achieved	Percentage (%)	Category
Content Eligibility	20	20	100	Very Valid
Linguistics	20	19	95	Very Valid
Evaluation	8	8	100	Very Valid
Appearance	24	24	100	Very Valid
Operation	16	14	88	Very Valid
Total	88	85	97	Very Valid

The assessment results from practitioners achieved an overall score of 85, with a maximum score of 88. Thus, a score of 97% was obtained, which is included in the very valid category for use by grade IV elementary school students.

3.4 Implementation

This research was tested on grade IV students of public elementary schools in Palembang, Indonesia. The trial was conducted using a questionnaire sheet through

individual and small groups' activity. The trial was conducted to find out and see students' responses to the developed flash flipbook media. The final product of the flash flipbook implemented to students can be seen in Figure 2 and 3.



Figure 2. Final product flash flipbook



Figure 3. Final product flash flipbook

The implementation stage was tested on students who filled out the questionnaire. The following is an explanation of the results of the trial conducted on grade IVB students of public elementary schools in Palembang, Indonesia.

3.4.1 One-to-One Trial

The division of students was done randomly based on different abilities. The implementation of this trial was carried out using smartphones from each student. The implementation of the trial went with a few obstacles because one of the children's smartphones could not be used. The solution was to ask the three students to see and read together so that students could understand the material clearly. The trial that had been

conducted obtained the results of the assessment of the student response questionnaire to the flash flipbook media in the implementation of the one-to-one trial. The results of the assessment of the student questionnaire sheet in the one-to-one trial, the total score obtained was 106 and the maximum total score was 120 with a percentage of 88% which was included in the very practical category.

3.4.2 Small group trial

The small group trial was conducted on seven students. The division of students was done randomly and adjusted to different abilities. The trial that was conducted had problems with the network from students' smartphones that could not access the product. The solution given was to ask students to study together and display the product using a projector, so that students could learn the material clearly. This trial was conducted by assessing the questionnaire sheet which obtained an overall score of 254 with a percentage of 91% in the very practical category.

3.5 Evaluation

The final stage is a form to determine the comparison of student results before and after using flash flipbook media using pretest and posttest tests. The following is a description of the values that have been done by students. The results of the N-Gain assessment obtained a value of 0.62 with the criteria of moderate. Based on this, it is concluded that flash flipbook media is included in the moderate criteria which has a positive impact on student outcomes to be used in motivating and understanding the material on changes in energy forms in science subjects. These results are similar to research conducted by Amaliyah et al., (2023) obtained an N-Gain value of 0.78. The study concluded that the developed flash flipbook proved effective in improving student understanding. In this study, digital literacy assessment consists of four main aspects, namely functional skills, collaboration, and communication, the ability to choose and search for information, and critical thinking and evaluation skills. The diagram below will present details of the pretest and posttest scores for each aspect of the digital literacy indicator (Figure 4).

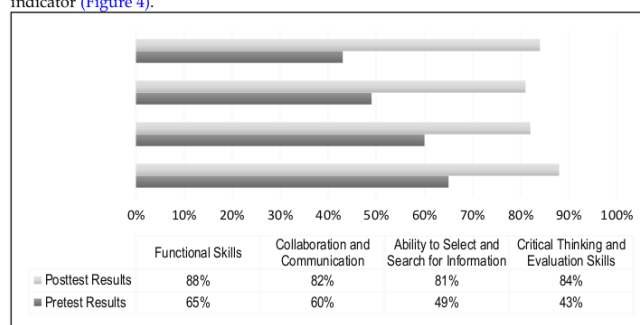


Figure 4. Student pretest and posttest results

Based on the diagram above, the total percentage of the overall pretest score is 51% with a fairly good category. The data has not reached the very good category in improving digital literacy, therefore a posttest was conducted at the end of learning after using flash flipbook media. The results of the overall student posttest can be obtained with a score of 83% with a very good category. The pretest data got a percentage of 51% while the posttest

results got a percentage of 83%, so it can be concluded that using flash flipbook media can improve digital literacy in grade IV elementary school students.

4. Discussion

Changes in students' digital literacy after using flash flipbook media is a one of the key impacts was observed from the implementation. It was measured by using pretest and posttest assessments that included indicators related to digital literacy, such as students' ability to access, understand, and use digital learning materials responsibly. Before the use of the flash flipbook media, students scored 86 on the digital literacy indicators, with a percentage of 51%, which falls under quite good category. It shows that while students had some basic understanding and ability to engage with digital tools, their competence was still limited, particularly in areas such as navigating digital content and integrating multimedia information for learning (Frolova et al., 2021; Lewin & McNicol, 2015). After using the flash flipbook media, students' scores increased significantly to 141 (83%), placing them in the very good category. It means there is any improvement by 32% in digital literacy levels. The enhancement occurred because the flash flipbook required students to interact with digital features—such as animations, videos, and navigation tools—that stimulated multiple senses and encouraged active participation.

The interactive nature of the media played a major role in this development (Putri & Poedjiastoeti, 2022; Sulistianingsih & Carina, 2019). Students learned to scroll, click, explore hyperlinked content, and engage with multimedia elements independently, which gradually improved their confidence and competence in using digital learning resources. Furthermore, the visually appealing and user-friendly interface helped reduce digital anxiety, especially for students who were not previously familiar with digital learning environments (Lopes & Jorge, 2019; Sezer et al., 2023). This improvement is in line with findings from previous studies, such as (Dewi et al., 2022), which showed that the use of digital modules significantly improved students' digital literacy (Yusuf et al., 2022), which found that flipbook media had a positive effect on students' ability to understand and respond to digitally presented content. Therefore, literacy is very important for learners because digital literacy supports students in accessing, understanding and critically evaluating information and allows teachers to design more interactive and contextualized learning (Suratmi et al., 2025). In conclusion, the flash flipbook media not only supported students' understanding of science material specifically the transformation of energy but also served as an effective tool to enhance their digital literacy skills, preparing them for more technology-integrated learning environments.

5. Conclusion

The development of flash flipbooks learning media showed that the product is achieved a very high level of validity. However, the results of both trials showed that flash flipbooks were very practical to use in a learning context, with a practicality level reaching 90%. The final evaluation was conducted through pretest and posttest to measure the impact of using flash flipbooks on students' understanding of digital literacy. The evaluation results showed an increase from 51% to 83% in the very good category. It confirms that the use of flash flipbooks is not only effective in improving students' digital literacy, but can also be used to develop students' abilities in interacting with technology, collaborating, communicating, choosing information wisely, and thinking critically. Thus, this study shows that the development of flash flipbooks as a learning resource has the potential to improve the quality of learning in elementary schools.

Authors Contribution: A.J. Syifah is collecting data, developing a questionnaire instrument, response questionnaire, assessing expert validation results, and evaluating. S. Suratmi responsible for validating the instrument, validates the initial design of the product, and guiding the first author. H. Hartono is responsible for editing and providing input suggestions for writing this article.

Conflict of Interest: The authors declare no conflict of interest.

Acknowledgements: Thanks are conveyed to the management, teaching staff, and teachers at the elementary school where the research was conducted, for providing the opportunity and service facilities during the research and thanks to the supervising lecturer who has guided us in completing this article.

6. References

- Amaliyah, D. I., Purwoko, R. Y., Kurniawan, H., & Wibowo, T. (2023). Pengembangan modul ajar berbasis problem based learning dalam bentuk flipbook untuk meningkatkan kemampuan berpikir kritis. *JP2M (Jurnal Pendidikan dan Pembelajaran Matematika)*, 9(2), 293–304. <https://doi.org/10.29100/jp2m.v9i2.4652>
- Amanullah, M. A. (2020). Pengembangan media pembelajaran flipbook digital guna menunjang proses pembelajaran di era revolusi industri 4.0. *Jurnal Dimensi Pendidikan dan Pembelajaran*, 8(1), 37. <https://doi.org/10.24269/dpp.v0i0.2300>
- Anjarwati, S. (2019). Pemanfaatan alam terbuka sebagai sumber belajar biologi. *BIOEDUKASI (Jurnal Pendidikan Biologi)*, 10(1), 55. <https://doi.org/10.24127/bioedukasi.v10i1.2009>
- Baek, J., Kim, H., Choi, S., Hong, S., Kim, Y., Kim, E., Lee, T., Chu, S. H., & Choi, J. (2024). Digital literacy and associated factors in older adults living in urban South Korea: A qualitative study. *CIN - Computers Informatics Nursing*, 42(3), 226–239. <https://doi.org/10.1097/CIN.0000000000001109>
- Belmonte, I. A., Collado, R. S., Yuguero, O., Oliva, J. A., Martínez-Millana, A., & Saperas Pérez, C. (2024). Digital literacy as a key element in the digital transformation of health organizations. *Atencion Primaria*, 56(6). <https://doi.org/10.1016/j.aprim.2024.102880>
- Branch, R. M. (2010). Instructional design: The ADDIE approach. In *Instructional Design: The ADDIE Approach*. <https://doi.org/10.1007/978-0-387-09506-6>
- Dewi, C. A., Kusuma, J. M., Pahria, P., & Syahri, W. (2022). Pengembangan modul digital pada materi struktur atom untuk menumbuhkan literasi digital siswa. *Journal of The Indonesian Society of Integrated Chemistry*, 14(2), 84–89. <https://doi.org/10.22437/jisic.v14i2.19930>
- Feng, X., & Liu, H. (2024). I feel blue—teacher, can you help me? A study on the effect of digital literacies on language learners' technostress, on-line engagement, autonomy, and academic success. *BMC Psychology*, 12(1), 1–18. <https://doi.org/10.1186/s40359-024-01637-5>
- Prolova, E. V., Rogach, O. V., Tyurikov, A. G., & Razov, P. V. (2021). Online student education in a pandemic: New challenges and risks. *European Journal of Contemporary Education*, 10(1), 43–52. <https://doi.org/10.13187/ejced.2021.1.43>
- García, J. M. G.-V., García-Carmona, M., Torres, J. M. T., & Fernández, P. M. (2023). Analysis of digital competence of educators (DigCompEdu) in teacher trainees: the context of Melilla, Spain. *Technology, Knowledge and Learning*, 28(2), 585–612. <https://doi.org/10.1007/s10758-021-09546-x>
- González-Salamanca, J. C., Agudelo, O. L., & Salinas, J. (2020). Key competences, education for sustainable development and strategies for the development of 21st century skills. A systematic literature review. *Sustainability (Switzerland)*, 12(24), 1–17. <https://doi.org/10.3390/su122410366>
- Haryanti, A. (2023). Pengembangan media e-flipbook untuk keterampilan menulis teks informatif siswa kelas III sekolah dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 1818–1829. <https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/54453/43296>
- Hasibuan, S., & Chairad, M. (2023). The development of Augmented Reality (AR) in anatomy course. *International Journal of Education in Mathematics, Science and Technology*, 11(3), 744–754. <https://doi.org/10.46328/ijemst.3282>
- Kateryna, A., Oleksandr, R., Mariia, T., Iryna, S., Evgen, K., & Anastasiia, L. (2020). Digital literacy development trends in the professional environment. *International Journal of Learning, Teaching and Educational Research*, 19(7), 55–79. <https://doi.org/10.26803/ijlter.19.7.4>
- Landina, I. A. P. L., & Agustiana, I. G. A. T. (2022). Meningkatkan berpikir kritis siswa melalui media pembelajaran flipbook berbasis kasus pada muatan IPA kelas V SD. *Mimbar Ilmu*, 27(3), 443–452. <https://doi.org/10.23887/mi.v27i3.52555>
- Latip, A., Sutantri, N., & Hardinata, A. (2022). The effect of digital literacy on student learning outcomes in chemistry learning. *Jurnal Inovasi Pendidikan IPA*, 8(2), 112–120. <https://doi.org/10.21831/jipi.v8i2.40567>

- Lewin, C., & McNicol, S. (2015). Supporting the development of 21st century skills through ICT. *KEYCIT 2014: Key Competencies in Informatics and ICT*, 181–198. https://publishup.uni-potsdam.de/files/8267/cid07_5181-198.pdf
- Lopes, D. S., & Jorge, J. A. (2019). Extending medical interfaces towards virtual reality and augmented reality. *Annals of Medicine*, 51(sup1), 29–29. <https://doi.org/10.1080/07853890.2018.1560068>
- Martatiyana, D. R., Novita, L., & Purnamasari, R. (2022). Pengembangan bahan ajar flipbook manfaat energi kelas IV di sekolah dasar. *Muallimuna: Jurnal Madrasah Ibtidaiyah*, 1, 99–112. <https://doi.org/10.31602/muallimuna.v8i1.7244>
- Nariswari, N. P., Hidayat, S., & Hariz, A. R. (2022). Pengembangan e-flipbook materi perubahan lingkungan berbasis literasi lingkungan sebagai sumber belajar biologi pada siswa SMA/MA. *NCOINS: National Conference of Islamic Natural Science*, 2(1), 81–94. <https://proceeding.iainkudus.ac.id/index.php/NCOINS/article/view/339/134>
- Neag, A., Bozdağ, Ç., & Leurs, K. (2025). Media literacy education for diverse societies. *Oxford Research Encyclopedia of Communication*, 1–23. <https://oxfordre.com/communication/view/10.1093/acrefore/9780190228613.001.0001/acrefore-9780190228613-e-1268>
- Nurzhanova, S., Stambekova, A., Zhaxylikova, K., Tatarinova, G., Aitenova, E., & Zhumabayeva, Z. (2023). Investigation of future teachers' digital literacy and technology use skills. *International Journal of Education in Mathematics, Science and Technology*, 12(2), 387–405. <https://doi.org/10.46328/ijemst.3826>
- Permata, S. D., & Khusniyah, T. W. (2022). Pemanfaatan sumber belajar untuk meningkatkan literasi sains sekolah dasar (Studi kasus di Kecamatan Tegalrejo Yogyakarta). *Jurnal Pendidikan Modern*, 7(2), 75–81. <https://doi.org/10.37471/jpm.v7i2.431>
- Pulungan, M., Maharani, S. D., Waty, E. R. K., Safitri, M. L. O., Suganda, V. A., & Husni, F. T. (2022). Development of E-student worksheets in the form of picture stories using live worksheets in primary schools. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 7(2), 157–167. <https://doi.org/10.25217/ji.v7.i2.1759>
- Putra, A. D., Yulianti, D., & Fitriawan, H. (2023). Pengembangan bahan ajar berbasis flipbook digital untuk meningkatkan efektivitas pembelajaran pada siswa sekolah dasar. *JlIP - Jurnal Ilmiah Ilmu Pendidikan*, 6(4), 2173–2177. <https://doi.org/10.54371/jljp.v6i4.1748>
- Putri, M. D., & Poedjiastoeti, S. (2022). Pengembangan multimedia interaktif pada materi kimia dalam kehidupan sehari-hari sebagai penunjang kegiatan literasi sains untuk siswa tunarungu SMALB. *UNESA Journal of Chemical Education*, 11(1), 23–33. <https://doi.org/10.26740/ujced.v11n1.p23-33>
- Rojas, C. N., Peñafiel, G. A. A., Buitrago, D. F. L., & Romero, C. A. T. (2021). Society 5.0: A Japanese concept for a superintelligent society. *Sustainability (Switzerland)*, 13(12). <https://doi.org/10.3390/su13126567>
- Saro, J. M., Guzman, M. T., Ochavez, E. E., & Dano, C. O. (2023). Ethno-learning resources in teaching biology for promoting sustainability education: A district-wide science problem. *American Journal of Education and Technology*, 2(2), 1–9. <https://doi.org/10.54536/ajet.v2i2.1322>
- Sezer, B., Sezer, T. A., Teker, G. T., & Elcin, M. (2023). Developing a virtual patient: design, usability, and learning effect in communication skills training. *BMC Medical Education*, 23(1). <https://doi.org/10.1186/s12909-023-04860-7>
- Sulistianingsih, A., & Carina, A. (2019). Developing interactive e-book as material technology coursebook by flipbook maker software. *Journal of Education and Practice*, 1735, 11–17. <https://doi.org/10.7176/jep/10-24-03>
- Suratmi, S., Ilhami, A., Azka, D. A., Defliyanto, D., Nopriyanti, N., & Nurhasan, N. (2025). Pelatihan penguatan literasi dan numerasi dalam pemulihan pembelajaran pada SMP di Kabupaten Ogan Ilir. *Jurnal Pengabdian UNDIKMA*, 6(1), 70–80. <https://ejournal.undikma.ac.id/index.php/jpu/article/download/13600/6818>
- Yusuf, N., Setyawan, H., Immawati, S., Santoso, G., & Usman, M. (2022). Pengembangan media flipbook berbasis fabel untuk meningkatkan pemahaman pesan moral pada peserta didik di sekolah dasar. *Jurnal Basicedu*, 6(5), 8314–8330. <https://doi.org/10.31004/basicedu.v6i5.3735>

34. Developing flash flipbook as a learning resource to improve.pdf

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