ANALYSIS OF PBL-BASED FLIPBOOK E-MODULE IN ENHANCING ELEMENTARY SCHOOL STUDENTS' CRITICAL THINKING SKILLS: A LITERATURE STUDY

Sri Adhi Endaryati[1], St. Y. Slamet[2], Kartika Chrysti Suryandari[3]
[1,2,3] Universitas Sebelas Maret, Surakarta
sriadhiendaryati@student.uns.ac.id

Keyword
e-module flipbook, problem based learning, critical thinking.

Abstract

Mastery of 21st-century competencies for students is one of the efforts to strengthen the competitiveness of human resources, and one of these competencies is critical thinking skills. Learning tools integrated with technology have become one of the needs of 21st-century students in the digital era. This article is part of research on developing a Problem-Based Learning-based flipbook e-module to enhance critical thinking skills in elementary school students. The article describes one of the results of the needs analysis, which is a literature study consisting of previous research studies related to the use of Problem-Based Learning-based flipbook e-modules in improving critical thinking skills in elementary school students. The research method used in this study is a literature review, specifically analyzing articles from previous research studies on using Problem-Based Learning-based flipbook e-modules to enhance critical thinking skills in elementary school students. The review is limited to accredited journals from 2019 to 2023. The conclusion drawn from this study is that flipbook e-modules have been widely used in elementary school learning, focusing on specific subjects such as Mathematics, Science, and thematic subjects. Flipbook e-modules can be created using Kvsoft Flipbook Maker or Fliphtml5, incorporating elements such as images, videos, music, and quiz exercises. Flipbook e-modules can be effectively used to enhance critical thinking skills when integrated with innovative learning models such as Problem-Based Learning. The findings of this study can serve as a reference for future research and development of e-modules.

INTRODUCTION

Mastery of 21st-century competencies for students is sought to enhance the competitiveness of human resources, and one of these competencies is critical thinking (Sari & Atmojo, 2021). The digital era has entered the realm of education, necessitating adjustments to keep up with technological advancements to create smooth learning experiences and achieve optimal learning outcomes (Marta, 2019). Technology can be utilized in educational settings to reform learning according to the needs of 21st-century students (Ishaq et al., 2020). A dynamic learning environment can be created through the utilization of digital technology (Shatri, 2020). Therefore, teachers need to innovate their teaching methods in accordance with the implementation of Technological Pedagogical and Content Knowledge (TPACK) In the classroom, this involves integrating technology and pedagogy (Abubakir & Alshaboul, 2023).

- The learning climate in elementary schools has not yet been able to empower critical thinking skills (Saad & Zainudin, 2022). Low levels of critical thinking skills are frequently found in various regions of Indonesia. (Kurniawati & Mawardi, 2023). Critical thinking skills are closely related to reading literacy, and Indonesia ranks low at 74 out of 79 countries in the Programme for International Student Assessment (PISA) (Ristanti & Rahayu, 2023). This supports the facts in the field, as research by (Ristanti & Rahayu, 2023) and (Endaryati, Sri Adhii et al., 2021) This indicates the continued low levels of critical thinking among elementary school students. This condition is attributed to the lack of focus on problem-based learning in the current teaching methods, which results in students not being accustomed to being stimulated to solve problems (Anggraeni et al., 2023). The instructional model also influences the stimulation of critical thinking skills (Maryam et al., 2020). Another contributing factor is that teachers have not yet implemented innovative teaching methods and learning tools integrated with technology (Tulus & Sulianto, 2023).
- The persistent low levels of critical thinking skills can lead to a decrease in the competitiveness of human resources in the era of advancing globalization (Handari & Supriatna, 2023). Additionally, the academic performance and learning outcomes of students may also decline as critical thinking is closely related to students' ability to stimulate understanding and problem-solving through logical reasoning (Mulyanti et al., 2023). The aforementioned issues can be addressed by developing innovative teaching methods that integrate digital technology, creating an enjoyable learning environment (Rizal, 2023). Innovations in teaching can take the form of instructional media that incorporate features such as images, videos, interactive quizzes, and educational music (Pratiwi et al., 2022). Those features can be found in applications such as e-module flipbooks, which package the needs of 21st-century students into a comprehensive learning module (Sari & Atmojo, 2021). E-modules can be effective when they apply appropriate instructional models within them (Twiningsih et al., 2019). Problem-Based Learning (PBL) can be considered as a solution for an instructional model to enhance critical thinking skills (Endaryati, Sri Adhi et al., 2023).
- E-modules, as non-print or electronic digital teaching materials, are systematically organized to assist students in independent learning (Salsabila et al., 2023). E-modules are easily accessible using familiar technology devices for students (Darmaji et al., 2020). Flipbook e-modules, as digital teaching materials, provide an interactive experience similar to flipping through a printed book. They contain learning materials, videos, images, and quiz exercises (Maynastiti et al., 2020). Problem-Based Learning (PBL) is an innovative student-centered instructional model focusing on problem-solving activities (Meneses et al., 2023). This instructional model is believed to enhance critical thinking skills (Wahdaniyah et al., 2023). According to Facione, critical thinking is the skill of analyzing and evaluating a problem or issue (Mejia & Sargent, 2023). Therefore, the development of e-modules that cater to the needs of 21st-century students is necessary.

Several studies have shown that PBL-based flipbook e-modules can enhance critical thinking skills (Nuha et al., 2019). Flipbook-based media for science learning can enhance students' competence in critical thinking skills (Aprilia, 2021). Innovations in digital media learning can enhance 21st-century skills, particularly critical thinking (Roemintoyo & Budiarto, 2021). The development of PBL-based flipbook e-modules presents a positive opportunity in empowering critical thinking skills. Therefore, this study describes the analysis related to PBL-based flipbook e-modules in enhancing critical thinking skills among elementary school students. The findings from this research can serve as a reference for future studies and development related to innovative e-module initiatives.

RESEARCH METHODS

This research method involves a literature review, drawing conclusions from previous studies that serve as references (Creswell, 2015). The researcher conducted a study on the use of PBL-based flipbook e-modules to enhance critical thinking skills among elementary school students. The study's data collection technique involved using secondary data from relevant previous research articles published in accredited journals from 2019 to 2023 (Ayudha & Setyarsih, 2021).

The findings of the study are described based on two main focuses: 1) the development orientation of flipbook e-modules, and 2) PBL-based e-modules in enhancing critical thinking skills among elementary school students.
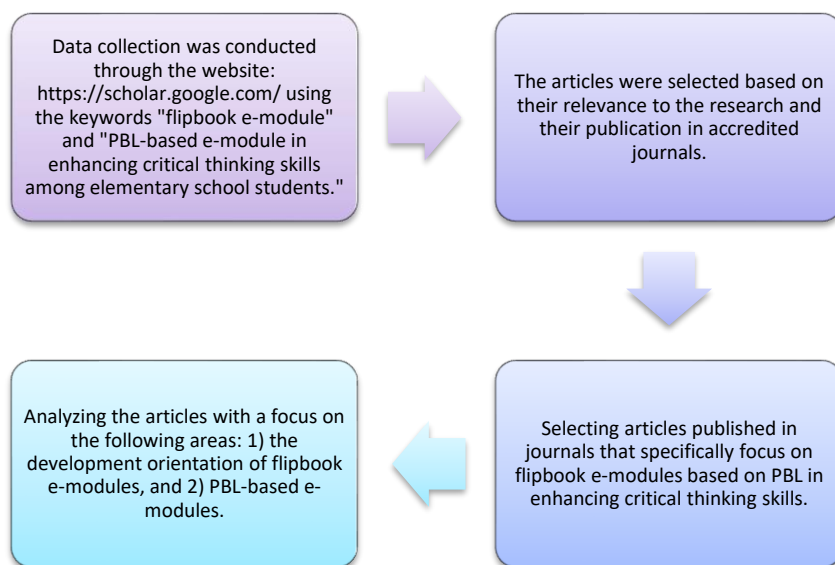
Data collection was conducted through the website: https://scholar.google.com/ using the keywords "flipbook e-module" and "PBL-based e-module in enhancing critical thinking skills among elementary school students."

The articles were selected based on their relevance to the research and their publication in accredited journals.

Selecting articles published in journals that specifically focus on flipbook e-modules based on PBL in enhancing critical thinking skills.

Analyzing the articles with a focus on the following areas: 1) the development orientation of flipbook e-modules, and 2) PBL-based e-modules.

Figure 1. Data Collecting Procedure and Analysis

RESULTS AND DISCUSSION

Based on the search results of the selected articles, they were analyzed based on two interrelated discussions. These discussions will be presented regarding the development of flipbook e-modules and PBL-based e-modules in enhancing critical thinking skills among elementary school students.

Orientation of E-Modul Flipbook Development

The results of the study on the development orientation of flipbook e-modules are presented in Table 1. Results of Flipbook E-Modules Development

Author	Results
(Landina & Agustiana, 2022)	The flipbook media platform, FlipHTML5, is considered suitable for use in learning environments.
(Martatiyana et al., 2022)	Flipbook instructional materials have been proven to be suitable and engaging for student learning.
(Surahman et al., 2023)	E-modules can be created using a flipbook maker for thematic learning, focusing on visual presentation, easy-to-understand language, and incorporating audiovisual elements.
(Melyastiti et al., 2023)	PBL-based e-modules have been proven to be effective in improving mathematics learning outcomes.
(Hairani & Amini, 2023)	Integrated thematic instructional materials based on problem-solving and created using Kvisoft Flipbook Maker Pro have been proven to be practical and effective for use by third-grade elementary school students.
(Pakpahan et al., 2022)	The flipbook e-module on the topic of Earth and the Universe for sixth-grade students has been validated and found to be practical for use by teachers.
(Oktaviana et al., 2019)	The use of Kvisoft Flipbook Maker for creating e-modules has been found to be highly effective in teaching the concept of length units in mathematics for third-grade elementary school students.
(Kumalasani & Eilmelda, 2022)	Flipbook e-modules have been proven to be effective in elementary school thematic learning, as they facilitate students' understanding of the subject matter.
(Ramadhina & Pranata, 2022)	Flipbook-based e-modules have been extensively tested and found to be highly suitable for elementary school learning.
(Endaryati, Sri Adhii et al., 2021)	Flipbook e-modules created using the FlipHTML5 application can serve as a reference for developing science e-modules for elementary school students. These e-modules have the potential to empower students' critical thinking skills.

PBL-Based E-Modules have been Proven Effective in Enhancing Critical Thinking Skills Among Elementary School Students

The results of the study on PBL-based e-modules in enhancing critical thinking skills among elementary school students are presented in Table 2.

Table 2. Results of PBL-Based E-Modules in Enhancing Critical Thinking Skills among Elementary School Students

Author	Results
(Janna et al., 2023b)	PBL-based e-modules have been proven to empower students' critical thinking skills and improve their learning outcomes.
(Suharyat et al., 2023b)	The development of PBL-based e-modules can be implemented in science education and has been found to be highly effective in enhancing the critical thinking competencies of Indonesian students.

Author	Results
(Turnip et al., 2021)	The development of e-modules for fifth-grade mathematics in elementary schools has been deemed suitable for use and has been found to effectively enhance critical thinking skills competencies.
(Istiqomah et al., 2022)	The PBL-based Flipbook e-module on Environmental Pollution in Science is deemed suitable for use in teaching and learning.
(Mahmudah et al., 2022)	PBL-based e-modules in research have been effective in training students' critical thinking skills.
(Hanida & Rachmadiarti, 2022)	PBL-based e-modules for ecosystem learning are highly suitable for training students' critical thinking skills.
(Aufa et al., 2021)	PBL-based e-modules have an influence on students' critical thinking skills and their attitude towards environmental care.
(Rahmat et al., 2020)	The use of PBL-based e-modules has an impact on students' critical thinking skills.
(Ridho et al., 2021)	Digital books are suitable as a learning resource for science and can enhance 21st-century critical thinking skills.
(Endaryati, Sri Adhi et al., 2023)	PBL-based e-modules have been effective in enhancing critical thinking skills among elementary school students.

DISCUSSION

Based on the research conducted on 10 articles presented in Table 1, it was found that flipbook e-modules have been widely developed and used as digital teaching materials in elementary school learning (Ramadhina & Pranata, 2022). In addition, flipbook e-modules are also considered suitable and practical for use in learning, catering to the needs of 21st-century students (Pakpahan et al., 2022). Flipbook e-modules can be developed for various subject areas, including Science (IPA) (Endaryati, Sri Adhii et al., 2021), Mathematic (Melyastiti et al., 2023), and thematic (Kumalasani & Eilmelda, 2022). Flipbook e-modules can be created using Kvsoft Flipbook Maker software (Oktaviana et al., 2019) or Fliphtml5 (Landina & Agustiana, 2022). Flipbook e-modules can be effectively utilized when designed with innovative instructional approaches such as Problem Based Learning (PBL) (Istiqomah et al., 2022). Other innovative instructional models, such as Creative Problem Solving, can also be found in the development of flipbook e-modules (Hairani & Amini, 2023). An engaging e-module design with elements such as images, videos, music, and quizzes can significantly motivate students to learn (Surahman et al., 2023).

The development of e-modules uses various kinds of software, one of which is Kvisoft Flipbook Maker. Various kinds of research on module development with the software have also been carried out. Like research (Mulyono & Elly, 2023) which found that the presence of e-modules improved independence and learning outcomes. However, it should be noted the grade of the laptop used because the e-module application requires a laptop with high specs or grade. The research uses student subjects as learners which also involves media experts, linguists, and material experts. The results of the study stated that e-modules that meet valid, practical, and effective criteria that have been assessed by experts and users can be an alternative learning resource for students and lecturers. Next, research (Maharcika et al., 2021) Those who used teachers and elementary school students as research subjects found that the practicality of teachers and students reached 87.19% which was included in the very high category after the e-module was made several improvements according to expert input. The e-module in the research replaced group learning activities into independent learning activities with consideration of the technical side of the practicality of the e-module. As stated in the study (Hamid & Alberida, 2021)

that e-modules are suitable for use as a source of independent learning. The study was conducted on high school students who stated that the use of flipbbok e-modules can increase students' interest in learning. Research (Widiana & Rosy, 2021) Also using vocational high school students revealed that the Flipbook Maker-based e-module obtained a decent percentage of 85% by material experts, 92% by media experts, 88% by linguists, and student questionnaire results obtained a percentage of 95.45%. So it can be concluded that flipbook maker-based e-modules on office technology subjects are very feasible to be applied in the school.

The development of flipbook e-modules with other flipbook maker software is carried out by (Susilawati et al., 2020) proving that the use of e-modules can increase students' curiosity and is effective for increasing mastery of straight-motion concepts in grade X Madrasah Aliyah students or high school equivalent. The study obtained t-test analysis results of 6.209 and gain test of 0.510 in the experimental group in the medium category. Meanwhile, the control group obtained a gain test of 0.270 which was in the low category. Research (Oktaviara & Pahlevi, 2019) finding that the e-module assisted by KVISOFT Flipbook Maker coupled with a Sainitive approach obtained a percentage of student responses in a limited trial of 94.4% with a very strong interpretation. The research was conducted on grade X vocational high school students and suggested that the preparation of e-modules should pay attention to the use of language and the preparation of images in order to make it easier for students to learn the material in the e-module. As conveyed in the study (Afifah et al., 2023) that the e-flipbook contains illustrations in the form of pictures and videos that are difficult to explain directly by the teacher so that students are able to easily understand abstract materials. The study also proved that the use of e-flipbooks can improve the critical thinking skills of grade XI high school students on immune system material which is also assisted by a discovery-based unity of science learning model. Research (Hasibuan et al., 2022) also found that the use of interactive e-modules based on kvisoft flipbook with discovery learning model had a significant effect on the learning outcomes of grade X high school students.

Based on the research conducted on the 10 articles presented in Table 2, it was found that PBL-based e-modules have effectively enhanced critical thinking skills among elementary school students (Janna et al., 2023b). The development of PBL-based e-modules significantly enhances critical thinking skills in elementary school science learning (Suharyat et al., 2023b). Furthermore, the development of PBL-based e-modules can be implemented in other subjects such as mathematics (Turnip et al., 2021). Students' critical thinking skills can be cultivated through the use of PBL-based e-modules (Mahmudah et al., 2022). The PBL framework can stimulate students' critical thinking skills as the learning activities in PBL are student-centered, encouraging active engagement and problem-solving (Istiqomah et al., 2022). Problem-oriented learning can train students to engage in higher-order critical thinking (Hanida & Rachmadiarti, 2022). Other studies, such as (Aufa et al., 2021), (Rahmat et al., 2020), (Ridho et al., 2021), (Endaryati, Sri Adhi et al., 2023) supporting that PBL-based e-modules are highly suitable, valid, and practical for enhancing students' critical thinking skills.

The development of e-modules based on problem-based learning (PBL) has also been carried out by many students from various levels, research (Nia et al., 2022) stated that PBL-based e-modules are suitable for use in environmental conservation materials as evidenced by obtaining material expert assessments of 82.8% and design experts of 83.3%. Research (Suharyat et al., 2023a) states that the use of PBL-based e-modules can effectively improve critical thinking skills which can be seen in the effect size of 1.105, student average score of 77.5, standard deviation of 0.23 and N-gain of 0.66. Research (Ramadanti et al., 2021) proving that PBL-based e-modules can effectively improve the learning outcomes of junior high school students. The research was conducted on data presentation materials for junior high school students. This is also in line with research (Pramana et al., 2020) which states that PBL-based e-modules are very well worth using in the learning process. Research (Janna et al., 2023a) proving that the use of PBL-based e-modules can improve students' critical thinking skills in students.

Other PBL-based e-module development research is conducted by (Vianis et al., 2022) revealed that PBL-based e-modules are more effective for improving student learning outcomes compared to conventional learning because they can be used anywhere and anytime. The study also states that the syntax of the PBL model can guide students' critical thinking patterns to be

better because each student is given assistance in building reasoning and communication in order to discuss, interact, and solve problems. This is what triggers an increase in critical thinking skills. (Kurniawan et al., 2023) also found that the use of e-modules with PBL can improve the critical thinking skills of grade X vocational high school students as evidenced by the improvement in each indicator. The study also revealed that each indicator of critical thinking skills can be seen from the positive learning attitudes of students, such as (1) students can ask questions clearly, carefully, accurately; (2) can think reflectively and anlogically; (3) be able to make logical conclusions; and (4) be able to communicate the results of his thoughts well. Limited, (Sujanem et al., 2022) proving that PBL-assisted e-modules can effectively improve students' critical thinking skills even though the PBL model is implemented with online learning scenarios. This is supported because of the ability of PBL-based e-modules that contain unstructured problems, physical phenomena, essential and strategic counseling, animation, videos to concepts that mediate critical thinking skills and critical thinking exercises. (Rismayanti et al., 2022) mentioned that e-modules provide a new and not boring learning experience because the presentation of different material creates interest for students. Moreover, it is equipped with a menu of assessments and evaluations containing HOTS questions so that students actively interact with the material in the e-module. Research (Rismayanti et al., 2022) also proves that PBL-based e-modules are feasible and interesting to use, especially in improving critical thinking skills.

CONCLUSION

Based on the analysis of the articles, it can be concluded that the development of flipbook e-modules has been widely conducted in elementary school education, focusing on specific subjects such as Mathematics, Science, and thematic learning. Flipbook e-modules can be created using tools like Kvsoft Flipbook Maker or Fliphtml5, incorporating elements such as images, videos, music, and quiz exercises. These e-modules can effectively enhance critical thinking skills when integrated with innovative instructional models like Problem Based Learning (PBL). Therefore, further research on PBL-based flipbook e-modules is needed to improve critical thinking skills among elementary school students. This study is expected to serve as a foundation for the development of high-quality instructional materials that meet the needs of 21st-century students. The findings of this study can also serve as a reference for future research on the development of e-modules.

ACKNOWLEDGEMENT

REFERENCES

Abubakir, H., & Alshaboul, Y. (2023). Heliyon Unravelling EFL teachers ' mastery of TPACK : Technological pedagogical and content knowledge in writing classes. *Heliyon*, *9*(6), e17348. https://doi.org/10.1016/j.heliyon.2023.e17348

Afifah, R. N., Sa'adah, S., & Maryanti, S. (2023). Pengaruh Pembelajaran Sistem Imunitas Melalui Model Discovery Based Unity of Science (DBUS) Berbantu Media E-Flipbook terhadap Kemampuan Berpikir Kritis Siswa. *Jurnal Inovasi Pendidikan*, *1*(2), 82–100. Diambil dari https://edukhasi.org/index.php/jip

Anggraeni, D. made, Prahani, B. K., Suprapto, N., Shofiyah, N., & Jatmiko, B. (2023). Systematic Review of Problem Based Learning Research in Fostering Critical Thinking Skills. *Thinking Skills and Creativity*, *49*. https://doi.org/https://doi.org/10.1016/j.tsc.2023.101334

Aprilia, T. (2021). Efektivitas Penggunaan Media Sains Flipbook Berbasis Kontekstual untuk Meningkatkan Kemampuan Berfikir Kritis Siswa. *Jurnal Penelitian Ilmu Pendidikan*, *14*(1), 10–21. https://doi.org/https://doi.org/10.21831/jpipfip.v14i1.32059

Aufa, M. N., Rusmansyah, Hasbie, M., Jaidie, A., & Yunita, A. (2021). The Effect of Using e-module Model Problem Based Learning (PBL) Based on Wetland Environment on Critical Thinking Skills and Environmental Care Attitudes. *Jurnal Penelitian Pendidikan IPA*, *7*(3), 401–407. https://doi.org/10.29303/jppipa.v7i3.732

Ayudha, C. F. H., & Setyarsih, W. (2021). Studi Literatur : Analisis Praktik Pembelajaran Fisika Di Sma Untuk Melatih Keterampilan Pemecahan Masalah. *Jurnal Pendidikan Fisika Undiksha*, *11*(1), 16. https://doi.org/10.23887/jjpf.v11i1.33427

Creswell, J. W. (2015). *Riset Pendidikan: Perencanaan, Pelaksanaan, dan Evaluasi Riset Kualitatif dan Kuantiatif* (Edisi dala). Yogyakarta: Pustaka Pelajar.

Darmaji, D., Kurniawan, D. A., Astalini, A., Winda, F. R., Heldalia, H., & Kartina, L. (2020). The Correlation Between Student Perceptions of the Use of E-Modules with Students' Basic Science Process Skills. *JPI (Jurnal Pendidikan Indonesia)*, *9*(4), 719–729. https://doi.org/10.23887/jpi-undiksha.v9i4.28310

Endaryati, Sri Adhi, Slamet, S. Y., & Suryandari, K. C. (2023). Problem-Based Learning Flipbook E-Module in Improving Students ' Critical Thinking Skills in " Always Save Energy " Thematic Learning. *International Journal of Elementary Education*, *7*(1), 115–123. https://doi.org/https://doi.org/10.23887/ijee.v7i1.58306 Problem-Based

Endaryati, Sri Adhii, Atmojo, I. R. W., Slamet, S. Y., & Suryandari, K. C. (2021). Analisis E-Modul Flipbook Berbasis Problem Based Learning untuk Memberdayakan Keterampilan Berpikir Kritis Pembelajaran IPA Sekolah Dasar. *DWIJA CENDEKIA: Jurnal Riset Pedagogik*, *5*(2), 300–312. https://doi.org/https://doi.org/10.20961/jdc.v5i2.56190

Hairani, S., & Amini, R. (2023). Development of Integrated Thematic Teaching Materials Based on Creative Problem Solving Assisted by Kvisoft Flipbook Maker Pro in the Third Grade of Elementary School. *Al-Islah: Journal of Education*, *15*(2), 2156–2165. https://doi.org/10.35445/alishlah.v15i2.2864

Hamid, A., & Alberida, H. (2021). Pentingnya Mengembangkan E-Modul Interaktif Berbasis Flipbook di Sekolah Menengah Atas. *EDUKATIF : JURNAL ILMU PENDIDIKAN*, *3*(3), 911–918.

Handari, A. T., & Supriatna, E. (2023). Penerapan Metode Mind Mapping Untuk Meningkatkan Berpikir Kritis Siswa Dalam Pembelajaran IPS. *Jurnal Perseda*, *VI*(1), 33–39. https://doi.org/https://doi.org/10.37150/perseda.v6i1.1762

Hanida, J. R., & Rachmadiarti, F. (2022). The Ecosystem Problem-Based Learning E-module To Train Critical Thinking Skills During COVID-19 Pandemic. *Journal of Biology Education*, *11*(2), 138–150. https://doi.org/https://doi.org/10.15294/jbe.v11i2.55257

Hasibuan, S. H., Zulfarina, & Putra, R. A. (2022). Pengembangan E-Modul Interaktif Berbasis Kvisofr FLipbook dengan Model Discvovery Learning pada Materi Arthropoda. *Saintifika*, *24*(2), 109–121.

Ishaq, K., Mat Zin, N. A., Rosdi, F., Abid, A., & Ijaz, M. (2020). The Impact of ICT on Students' Academic Performance in Public Private Sector Universities of Pakistan. *International Journal of Innovative Technology and Exploring Engineering*, *9*(3), 1117–1121. https://doi.org/10.35940/ijitee.c8093.019320

Istiqomah, I., Masriani, M., Rahmawan, R., Muharini, R., & Lestari, I. (2022). Pengembangan E-Modul Flipbook IPA Berbasis Problem Based Learning pada Materi Pencemaran Lingkungan. *Jurnal Basicedu*, *6*(5), 9156–9169. https://doi.org/https://doi.org/10.31004/basicedu.v6i5.3558

Janna, R. D., Yovita, & Vebrianto, R. (2023a). Pengembangan E-Modul Berbasis Problem Based Learning untuk Meningkatkan Kemampuan Berpikir Kritis dan Hasil Belajar Siswa. *Jurnal LITERASI*, *7*(1), 139–146.

Janna, R. D., Yovita, Y., & Vebrianto, R. (2023b). Pengembangan E-Modul Berbasis Problem Based Learning untuk Meningkatkan Kemampuan Berpikir Kritis dan Hasil Belajar Siswa. *Jurnal Literasi*, *7*(1), 139–146. https://doi.org/http://dx.doi.org/10.25157/literasi.v7i1.9657

Kumalasani, M. P., & Eilmelda, Y. (2022). Analisis Efektivitas Penggunaan E -Modul Berbasis Aplikasi Flipbook pada Pembelajaran Tematik di SD. *JP2SD (Jurnal Pendidikan dan Pengembangan Sekolah Dasar)*, *10*(1), 39–51. https://doi.org/https://doi.org/10.22219/jp2sd.v10i1.20175

Kurniawan, M. F., Listyaningsih, & Sujatmiko, T. (2023). Meningkatkan Kemampuan Berpikir Kritis Melalui Model Problem Based Learning Bermedia E-modul pada Peserta Didik SMKN 2 Bojonegoro. *DedikasiMU (Journal of Community Service)*, *5*(3), 275–284.

Kurniawati, A., & Mawardi, M. (2023). Pengembangan Media Flash Card IPA Terintegrasi Model Two Stay Two Stray Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa Kelas 5 SD Development of Science Flash Card Media Integrated Two Stay Two Stray Model to Improve Critical Thinking Skills of Grade. *Tunas: Jurnal Pendidikan Guru Sekolah Dasar*, *8*(2), 110–118. https://doi.org/https://doi.org/10.33084/tunas.v8i2.5085

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. *Jurnal Mimbar Ilmu*, *27*(3), 443–452. https://doi.org/10.23887/mi.v27i3.52555

Maharcika, A. A. M., Suarni, N. K., & Gunamantha, I. M. (2021). Penggunaan Modul Elektronik (E-Modul) Berbasis Flipbook Maker untuk Subtema Pekerjaan di Sekitarku Kelas IV SD/MI. *PENDASI: Jurnal Pendidikan Dasar Indonesia*, *5*(2), 165–174.

Mahmudah, S., Kirana, T. K. M. S., & Rahayu, Y. S. (2022). Profile of Students' Critical Thinking Ability: Implementation of E-Modul Based On Problem-Based Learning. *IJORER : International Journal of Recent Educational Research*, *3*(4), 478–488. https://doi.org/https://doi.org/10.46245/ijorer.v3i4.231

Marta, L. C. (2019). The Integration of Digital Devices into Learning Spaces According to the Needs of Primary and Secondary Teachers. *TEM Journal*, *8*(4), 1351–1358. https://doi.org/10.18421/TEM84-36

Martatiyana, D. R., Novita, L., & Purnamasari, R. (2022). Pengembangan Bahan Ajar Flipbook Manfaat Energi Kelas IV di Sekolah Dasar. *Muallimuna: Jurnal Madrasah Ibtidaiyah*, *8*(1), 44–57. https://doi.org/http://dx.doi.org/10.31602/muallimuna.v8i1.7244

Maryam, M., Kusmiyati, K., Merta, I. W., & Artayasa, I. P. (2020). Pengaruh Model Pembelajaran Inkuiri Terhadap Keterampilan Berpikir Kritis Siswa. *Jurnal Pijar Mipa*, *15*(3), 206–213. https://doi.org/10.29303/jpm.v15i3.1355

Maynastiti, D., Serevina, V., & Sugihartono, I. (2020). The Development of Flip Book Contextual Teaching and Learning-Based to Enhance Students' Physics Problem Solving Skill. *Journal of Physics: Conference Series*, *1481*(1). https://doi.org/10.1088/1742-6596/1481/1/012076

Mejia, M., & Sargent, J. M. (2023). Leveraging Technology to Develop Students' Critical Thinking Skills. *Journal of Educational Technology Systems*, *51*(4), 393–418. https://doi.org/https://doi.org/10.1177/00472395231166613

Melyastiti, N. M., Agung, A. A. G., & Sudarma, I. K. (2023). E-Modul Berbasis Problem Based Learning pada Mata Pelajaran Matematika di Sekolah Dasar. *Jurnal Ilmiah Pendidikan dan Pembelajaran*, *7*(1), 82–92. https://doi.org/https://doi.org/10.23887/jipp.v7i1.58538

Meneses, L. F. S., Pashchenko, T., & Mikhailova, A. (2023). Critical Thinking in The Context of Adult Learning Through PBL and E-Learning: A Course Framework. *Thinking Skills and Creativity*. https://doi.org/https://doi.org/10.1016/j.tsc.2023.101358

Mulyanti, N. M. B., Gading, I. K., & Diki, D. (2023). Dampak Penerapan Model Pembelajaran Inkuiri Terbimbing terhadap Hasil Belajar IPA dan Kemampuan Berpikir Kritis Siswa. *Jurnal Ilmiah Pendidikan Profesi Guru*, *6*(1), 109–119. https://doi.org/https://doi.org/10.23887/jippg.v6il.59276

Mulyono, D., & Elly, A. (2023). E-Modul Interaktif Teori Bilangan Menggunakan Aplikasi Kvisoft Flipbookmaker. *JINoP (Jurnal Inovasi Pembelajaran)*, *9*(1), 70–81.

Nia, Leksono, S. M., & Nestiadi, A. (2022). Pengembangan E-Modul Pelestarian Lingkungan Berbasis Problem Based Learning (PBL) Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa SMP. *PENDIPA Journal of Science Education*, *6*(2), 415–421. https://doi.org/10.33369/pendipa.6.2.415-421

Nuha, U., Wahyuni, S., Budiarso, A. S., Hasanah, U., & Anggraeni, N. E. (2019). The Effectiveness of Flipbook and Video to Improve Students' Critical Thinking Skills in Science Learning during

the COVID-19 Pandemic Ulin. *Lensa: Jurnal Kependidikan Fisika*, *9*(1), 32–37. https://doi.org/https://doi.org/10.33394/j-lkf.v9i1.3899

Oktaviana, N., Nayazik, A., & Rani, H. A. D. (2019). Efektivitas Penerapan E-Modul Berbasis Kvisoft Flipbook maker Materi satuan Panjang Kelas 3 SD. *Joined Jiurnal: Journal of Informatics Education*, *2*(1), 32–40. https://doi.org/https://doi.org/10.31331/joined.v2i1.839

Oktaviara, R. A., & Pahlevi, T. (2019). Pengembangan E-modul Berbantuan Kvisoft Flipbook Maker Berbasis Pendekatan Saintifik pada Materi Menerapkan Pengoperasian Aplikasi Pengolah Kata Kelas X OTKP 3 SMKN 2 Blitar. *Jurnal Pendidikan Administrasi Perkantoran*, *7*(3), 60–65.

Pakpahan, I. P., Selegi, S. F., & Syaflin, S. L. (2022). Pengembangan E-Modul Berbasis Flipbook Materi Bumi dan Alam Semesta pada Pembelajaran IPA Kelas IV SDN Sukakarya. *BADA'A: Jurnal Ilmiah Pendidikan Dasar*, *4*(2), 440–453. https://doi.org/10.37216/badaa.v4i2.649

Pramana, M. W. A., Jampel, I. N., & Pudjawan, K. (2020). Meningkatkan Hasil Belajar Biologi Melalui E-Modul Berbasis Problem Based Learning. *Jurnal Edutech Undiksha*, *8*(2), 17–32. https://doi.org/10.23887/jeu.v8i2.28921

Pratiwi, D., Larasati, A. N., & Berutu, I. L. (2022). Pentingnya Inovasi Media Pembelajaran Berbasis Digital di Abad-21. *BEST Journal (Biology Education, Sains and Technology)*, *5*(2), 211–216. https://doi.org/https://doi.org/10.30743/best.v5i2.5685

Rahmat, M. R., Arip, A. G., & Nur, S. H. (2020). Implementation of Problem- Based Learning Model Assisted by E-Modules on Students' Critical Thinking Ability. *JPI (Jurnal Pendidikan Indonesia)*, *9*(3), 339–346. https://doi.org/https://doi.org/10.23887/jpi-undiksha.v9i3.22410

Ramadanti, F., Mutaqin, A., & Hendrayana, A. (2021). Pengembangan E-Modul Matematika Berbasis PBL (Problem Based Learning) pada Materi Penyajian Data untuk Siswa SMP. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(3), 2733–2745. https://doi.org/10.31004/cendekia.v5i3.759

Ramadhina, S. R., & Pranata, K. (2022). Pengembangan E-Modul Berbasis Aplikasi Flipbook di Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 7265–7274. https://doi.org/https://doi.org/10.31004/basicedu.v6i4.3470

Ridho, S., Wardani, S., & Saptono, S. (2021). Development of Local Wisdom Digital Books to Improve Critical Thinking Skills through Problem Based Learning. *Journal of Innovative Science Education*, *9*(3), 1–7. https://doi.org/10.15294/jise.v9i1.37041

Rismayanti, T. A., Anriani, N., & Sukirwan. (2022). Pengembangan E-Modul Berbantu Kodular pada Smartphone untuk Meningkatkan Kemampuan Berpikir Kritis Matematis Siswa SMP. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(1), 859–873. https://doi.org/10.31004/cendekia.v6i1.1286

Ristanti, E. D., & Rahayu, T. S. (2023). Pengembangan Media Pembelajaran Berbasis Power Point Untuk Meningkatkan Keterampilan Berpikir Kritis Pada Pembelajaran Tematik Kelas 3 di SDN Sudirman Ambarawa. *Jurnal Pendidikan dan Konseling*, *5*, 3873–3879. https://doi.org/https://doi.org/10.31004/jpdk.v5i2.13885

Rizal, A. S. (2023). Inovasi Pembelajaran untuk Meningkatkan Hasil Belajar Siswa di Era Digital. *Jurnal Kajian Keislaman dan Pendidikan*, *14*(1), 11–27. https://doi.org/https://doi.org/10.53915/jurnalkeislamandanpendidikan.v14i1.329

Roemintoyo, R., & Budiarto, M. K. (2021). Flipbook as Innovation of Digital Learning Media: Preparing Education for Facing and Facilitating 21st Century Learning. *Journal of Education Technology*, *5*(1), 8. https://doi.org/10.23887/jet.v5i1.32362

Saad, A., & Zainudin, S. (2022). A review of Project-Based Learning (PBL) and Computational Thinking (CT) in Teaching and Learning. *Learning and Motivation*, *78*. https://doi.org/https://doi.org/10.1016/j.lmot.2022.101802

Salsabila, S., Anriani, N., & Santosa, C. A. H. F. (2023). Pengembangan E-Modul pada Android Menggunakan Kodular untuk Meningkatkan Kemampuan Representasi Matematis Siswa. *Teorema: Teori dan Riset Matematika*, *8*(1), 1–10. https://doi.org/http://dx.doi.org/10.25157/teorema.v8i1.8704

Sari, F. F. K., & Atmojo, I. R. (2021). Analisis Kebutuhan Bahan Ajar Digital Berbasis Flipbook untuk Memberdayakan Keterampilan Abad 21 Peserta Didik pada Pembelajaran IPA Sekolah Dasar.

Jurnal Basicedu, *5*(6), 6079–6085. https://doi.org/https://doi.org/10.31004/basicedu.v5i6.1715

Shatri, Z. G. (2020). Advantages and Disadvantages of Using Information Technology in Learning Process of Students. *Journal of Turkish Science Education*, *17*(3), 420–428. https://doi.org/10.36681/tused.2020.36

Suharyat, Y., Santosa, T. A., Zulysuri, Suhaimi, & Gunawan, R. G. (2023a). Meta-Analisis: Pengaruh E-Modul Berbasis Problem Based Learning Terhadap Kemampuan Berpikir Kritis Siswa Dalam Pembelajara IPA Di Indonesia. *Jurnal Pendidikan dan Konseling*, *4*(1), 1349–1358.

Suharyat, Y., Santosa, T. A., Zulysuri, Z., Suhaimi, S., & Gunawan, R. G. (2023b). Meta-Analisis: Pengaruh E-Modul Berbasis Problem Based Learning Terhadap Kemampuan Berpikir Kritis Siswa Dalam Pembelajaran IPA Di Indonesia. *Jurnal Pendidikan dan Konseling*, *5*(1), 5069–5076. https://doi.org/https://doi.org/10.31004/jpdk.v5i1.11673

Sujanem, R., Suwindra, I. N. P., & Suswandi, I. (2022). Efektivitas E-Modul Fisika Berbasis Masalah Berbantuan Simulasi Phet Dalam Ujicoba Terbatas Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa SMA. *Jurnal Pendidikan Fisika Undiksha*, *12*(2), 181–191.

Surahman, S., Astuti, I., & Afandi, A. (2023). Flipbook Maker Based E-Module Development Design in Thematic Learning in Elementary School. *Jurnal Educatio*, *9*(2), 484–489. https://doi.org/10.31949/educatio.v9i2.4456

Susilawati, Pramusinta, & Saptaningrum, E. (2020). Penguasaan Konsep Siswa Melalui Sumber Belajar e-Modul Gerak Lurus dengan Software. *Unnes Physics Education Journal*, *9*(1), 36–43.

Tulus, R., & Sulianto, J. (2023). Pengembangan Perangkat pembelajaran Model Kooperatif Tipe Think Pair Share (TPS) Dengan Pendekatan Konstruktivisme untuk Peningkatan Kemampuan Berpikir Kritis Siswa Kelas V SDN Tenggulangharjo. *Didaktik: Jurnal Ilmiah PGSD FKIP Universitas Mandiri*, *09*(02), 1701–1714. https://doi.org/https://doi.org/10.36989/didaktik.v9i2.862

Turnip, R. F., Rufi'i, R., & Karyono, H. (2021). Pengembangan E-modul Matematika Dalam Meningkatkan Keterampilan Berpikir Kritis. *JEMS (Jurnal Edukasi Matematika dan Sains)*, *9*(2), 485–498. https://doi.org/http://doi.org/10.25273/jems.v9i2.11057

Twiningsih, A., Sajidan, & Riyadi. (2019). The Ecosytem Thematic Teaching Using Problem Based Learning Model to Enhance Student's Critical Thinking Skill, *323*(ICoSSCE 2018), 8–12. https://doi.org/10.2991/icossce-icsmc-18.2019.2

Vianis, R. O., Subroto, W. T., & Susanti. (2022). Efektivitas Bahan Ajar E-Modul Berbasis IT dengan Model Problem Based Learning (PBL) pada Mata Pelajaran Kearsipan dalam Meningkatkan Hasil Belajar Peserta Didik di SMK Sunan Giri Menganti. *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, *10*(3), 211–222. https://doi.org/10.26740/jpap.v10n3.p211-222

Wahdaniyah, N., Agustini, R., & Tukiran, T. (2023). Analysis of Effectiveness PBL-STEM to Improve Student ' s Critical Thinking Skills. *IJORER: International Journal of Recent Educational Research*, *4*(3), 365–382. https://doi.org/https://doi.org/10.46245/ijorer.v4i3.312

Widiana, F. H., & Rosy, B. (2021). Pengembangan E-Modul Berbasis Flipbook Maker pada Mata Pelajaran Teknologi Perkantoran. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(6), 3728–3739