



Need Analysis of Mobile Learning Based on Problem-Based Learning for Elementary School Student

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Abstract

Critical thinking skills of elementary school students still need to be considered again, especially in learning Social Studies. One way to improve students' critical thinking skills is by using Mobile Learning Social Studies learning media. This study aims to determine the needs analysis in developing Mobile Learning based on Problem-Based Learning in learning Social Studies in Elementary Schools where the products developed are expected to be able to improve students' critical thinking skills. The research was conducted at East Jakarta Elementary School with 30 students as research subjects. The research method used is Research and Development using the ADDIE approach including Analysis, Design, Development, implementation and evaluation. However, the implementation in this research only conducts the analysis stage to determine the analysis of student and teacher needs to develop mobile learning social studies products according to field needs. Data collection techniques used are observation, interviews and questionnaires. The results of this study are that the learning media used during learning still do not pay attention to the characteristics of students and the development of 21st century learning and learning models that are still fixated on classical learning models so that the development of PBL-based mobile learning media is needed.

Keywords: Mobile Learning, Problem-Based Learning, Need Analysis

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INTRODUCTION

The rapid development of technology and information has a positive influence on improving the quality of education in the learning process. The learning process began to shift from using conventional learning methods to student-centered learning methods. (Indriani et al., 2021). All learning must experience this transition. One way of centered learning is by developing learning media in the form of mobile learning using an effective model to use. Mobile learning is a learning media that contains materials that are packaged in the form of applications that utilize communication technology on mobile phones anywhere and anytime (Purosad et al., 2020). The use of mobile learning in learning can help them understand the concepts that will be presented in the material. So that it has positive feedback on the experience and further explores learning through mobile learning on learning engagement (Meng et al., 2023; Samoekan, 2021). Mobile learning plays a role in guiding students to learn independently, making it easier for students to understand teaching material, and making the classroom atmosphere



more interesting so that students are expected to be able to reason critically (Agus & Endang, 2021). Critical thinking is the ability to think using rational reasoning to be able to solve a problem faced by each individual in an integrated and structured manner, formulate innovative solutions, and reflect (Kurniawati & Ekayanti, 2020; Nurul & Mukhayyarotin, 2021). Critical thinking skills must be taught and exposed from an early age so that students can overcome the problems they will face. Critical thinking skills can be taught through social studies learning in elementary school. The purpose of elementary social studies learning is to foster a sense of responsibility for oneself and one's obligations in society, nation and state and is also expected to train intellectual skills in identifying and finding solutions to problems faced (Jumriani et al., 2021).

Seeing the importance of critical thinking skills, these skills must be trained from an early age. In the scope of elementary school, critical thinking skills can be trained through several existing lessons, one of which is social studies learning. Elementary social studies learning outcomes also refer to the ability, namely the ability to understand concepts and the ability to apply social studies understanding, such as the ability to think critically and creatively, the ability to solve problems, and the ability to make decisions (Sarah, 2021). This is done to achieve learning objectives in elementary school, so social studies learning needs to be taught as interesting and creative as possible. Based on the results of the needs analysis of teachers and students at SDN Pondok Bambu 04 by conducting interviews with teachers and students found problems such as, social studies learning materials in the independent curriculum teachers still separate science and social studies that should not be separated so that students can understand IPAS learning. The material is delivered without optimal media support. Learning only focuses on using thematic books and videos via Youtube.

The use of videos from YouTube is considered not optimal for use in learning because it is not in accordance with the development of student characteristics in class IV SDN Pondok Bambu 04. Activities have also applied methods in learning but implemented to students still not according to the syntax used. Furthermore, in practical activities, critical thinking skills in elementary schools still need to be improved, especially the critical thinking skills of grade 4 students at Pondok Bambu 04 Elementary School. Researchers found the problem of students still not being able to analyze further problems in elementary social studies learning. Students analytical skills can be seen from their answers in the evaluation in the form of descriptions with the Higher Order Thinking Skill (HOTS) model. When given questions with HOTS questions, students still have difficulty in understanding the intent and purpose of the question so that students need to be given further direction and guidance by the teacher to understand the meaning of the question.

Seeing this problem, the researcher aims to develop mobile learning as an alternative solution to the problem. The mobile learning developed is oriented towards problem-based learning (PBL). PBL is a learning model that can be said to be a strategy where students learn through practical problems related to real life (Flavia, 2023; Junaidi, 2020). Through a series of problems, it will then become the subject matter of systematic student learning activities. To be able to find these problems, students must search, analyze, synthesize and apply information to solve

problems given by the teacher at the beginning of class (Eric & Douglas, 2023; Jairina et al., 2020). Students can find the problems discussed critically and can conclude the problem. Problem solving is an important element in supporting student understanding and academic success. If students do not have problem solving skills, it will be difficult to solve problems faced throughout the learning process.

(Razilu, 2021) shows that the development of mobile learning using articulare storyline 3 is categorized as "Very feasible for use in learning. Research with research conducted by (Purbasari et al., 2019) produces research results, namely social studies learning media based on mobile learning applications is very feasible to use. Research conducted (Maulida, 2020) PBL model to improve thinking skills is very high. Research conducted (Suhardi et al., 2022) producing scientific-based mobile learning media is very feasible to use. Research (Salma et al., 2022) resulted in research that Interactive multimedia based on android to improve ritis skills is categorized as moderate.

The researchers developed a digital form that was developed in the form of an application. In developing handouts in this application using Unity software so that mobile learning is developed in the form of applications. The use of mobile learning must also pay attention to the appearance, content, and ease of access for students to have mobile learning (Elvani et al., 2022). The use of mobile learning in learning can increase student independence (Frans et al., 2023). In addition, the use of unity software has the advantage that the resulting application is easier to operate on various devices and roads such as cell phones, laptops and computers. This is done by researchers as one of the supports for students to take part in technological advances. The utilization of technology and information in learning in the 21st century has human resources who have knowledge, skills, critical thinking, digital literacy, technology and information (Mardhiyah et al., 2021).

METHODS

The development research conducted here uses the ADDIE model which has 5 stages in developing a product consisting of analysis, design, development, implementation, and evaluation

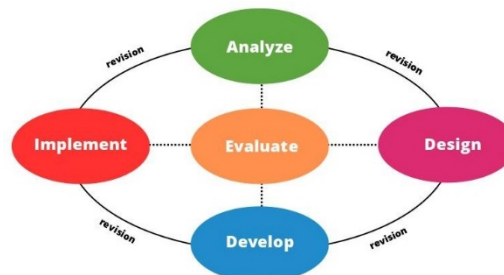


Figure 1. Stages of ADDIE Model (Robert, 2009)

The purpose of this study was to analyse the need to develop PBL-based mobile learning products in primary school social studies learning. This research was conducted with 30 IVgrade students at SD Pondok Bambu 04 Elementary School.

Judging from the research objectives, the research on needs analysis was conducted to teachers and students to obtain detailed data about problems in the learning process, especially in social studies lessons in grade 4. The data collection techniques used in the study are observation and interview with descriptive quantitative analysis. The following is an interview instrument for teacher and student needs analysis.

Table 1. Student Needs Analysis Instrument

No.	Aspect	Grid	Indicators	Instrument Number	
				Item Number	Number of Items
1.	Teaching materials	Learning media used at school	Teachers use social studies learning media in class	1	1
			Learning media used in learning IPAS colourfull	2	1
			The images used in the learning media are of good quality	3	1
		Companion learning media	Using YouTube videos is enough to facilitate IPAS learning	4	1
			Learning media is needed to make it easier for students	5	1
			Additional learning media in the form of PBL-based mobile learning is interesting to use in IPAS learning content	6	1
2.	Learning process	Learning material	The teacher teaches the material in the IPAS content by lecturing in front of the class.	7	1
			The teacher always relates the material in social studies learning to everyday life	8	1
			There is material in social studies learning that is very difficult for students to understand	9	1
3.	Facilities and infrastructure	Availability of gadgets	I have a mobile phone to support my learning	10	1
Total Question				10	10

RESULTS & DISCUSSION

The results and improvements of this research reflect the ADDIE research steps which include 5 stages, analysis, design, development, implementation, and evaluation. However, with the limited time in this study, the researchers only conducted this research stage limited to the needs analysis at the analysis stage. The results of the needs analysis focused on aspects of analyzing the IPAS learning process in grade IV SD. The results of the student needs analysis questionnaire are illustrated in Figure 2.

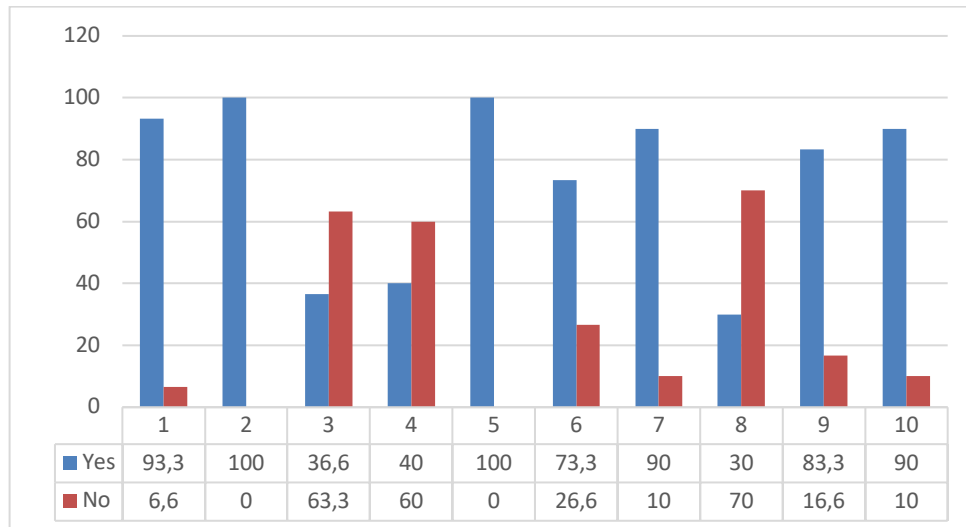


Figure 2. Diagram Need Analysis

Based on the results of the student analysis questionnaire, it is known that in learning IPAS the teacher has used learning media in the classroom. Media is one of the important elements that make learning more fun and meaningful for students (Pratiwi & Dzakiyah, 2024). The learning media used by teachers are learning videos from YouTube. The use of learning videos serves to make it easier for students to support learning activities, help students understand the subject matter, facilitate the teacher during teaching and learning activities in the classroom, direct the attention of learners to concentrate on the content of the lesson, understand and hear information or messages contained in the image, provide context for understanding the text, help those who are weak in reading to organize information in the text and remember it (Fitri & Ardipal, 2021; Suarni et al., 2019). This finding is in line with research which states that effectiveness in the learning process is influenced by the type of media chosen and the learning methods applied to significantly improve results (Khoir et al., 2020; Supiadi et al., 2023). The advantages of learning videos on YouTube include being able to help students understand the material better, as an independent learning media, and providing learning video features that can be accessed when users are online (Yeni et al., 2022). Learning videos are alternative learning media that can facilitate students' learning styles audibly and visually. Visual learning style is a learning style that dominantly uses the eyes so that it has a very important role in learning to more easily capture information by observing (Supit et al., 2023). To develop the potential of students with visual learning styles, teachers should focus more on moving demonstrations and give them objects related to the lesson (Mulabbiyah et al., 2019). Meanwhile, audio learning style is an auditory learning style that mostly uses the sense of hearing for individuals to learn more easily and capture stimulus through the sense organ of hearing (ear) (Maheni, 2019). To develop the abilities of students with audio learning styles, teachers should provide opportunities for discussion and participation in the classroom and family, and require oral expression of ideas so that information is easily understood. For example, students are encouraged to use their own knowledge and experience to solve problems rather than always relying on the opinions of others (Minasari & Susanti, 2023).

The use of learning videos from YouTube can already help the learning process but there are still many things that need to be improved because they are not in accordance with the characteristics of students in a school. Sometimes the learning videos used still do not think about the psychology of student development. There are still visualizations of

images that are not suitable for student growth and development. The selection of learning media must be adjusted to the development of students because the teaching and learning process must enable the process of interaction and mutual communication between teachers and students in accordance with the functions and learning objectives that have been set, can communicate learning materials effectively to students to describe learning materials, can prevent communication barriers in the teaching and learning process, such as verbalization, misunderstanding, lack of concentration, and lack of student understanding (Inayah, 2023). Seeing this, it is necessary to develop mobile learning as an alternative problem solving. By developing mobile learning media, it can increase motivation to follow the learning process in class (Herlina et al., 2023). Then the development of learning media has advantages such as; (1) having more flexible access when learning anywhere and anytime without limiting space and time (Talakua & Sesca Elly, 2020); (2) Media is interactive so that it is expected to attract students' interest in learning (Wulandari et al., 2019); (3) effective and efficient, so that in the process of learning activities users can learn independently (Herlina & Anwar, 2020).

In addition to learning media, the selection of teaching methods is still dominated by classical learning methods where learning activities are still dominated by the teacher. Classical learning is still less effective when done in the classroom because students feel bored and less focused on the teaching material delivered by the teacher (Nuraeni et al., 2022). In addition, the condition of students tends to be passive, even some students are seen doing busy work at their respective desks such as making fans from paper so that they show their boredom in learning. Then the students at the back were even busy chatting with their classmates without paying attention to the explanation of the material from the teacher. In general, students show a lack of student engagement in learning with teachers using classical methods in the classroom. Classical learning affects the learning carried out by the teacher so that it is boring for students, it is still difficult to understand the material, learning outcomes are not optimal, causing students' opportunities to make efforts to obtain information independently are still very limited and students feel less interested in the learning carried out by the teacher so that students' critical thinking skills are still not well developed by the teacher (Khoiruman & Banyuwangi, 2021; Utomo & Burhan, 2021). So that different learning is needed to overcome these solutions such as PBL learning. By using the PBL learning model, it can improve students' creative thinking skills in developing knowledge that can be applied in everyday life. So that in learning students do not only rely on memory to memorize, but students work together, communicate well in groups, take responsibility for solving a problem and can improve problem solving skills that stimulate active and creative student participation in dealing with contextual problems that commonly occur in everyday life (Handayani & Koeswanti, 2021). The improvement of critical thinking skills through mobile learning media is evidenced by the results of research conducted (Muhammad & Henny, 2021; Nofita et al., 2023; Noni et al., 2022). In developing critical thinking skills, students can use concrete knowledge that occurs in students' daily lives (Trimahesri & Hardini, 2019).

Mobile learning is developed using PBL steps where students learn by finding more than one information to solve problems. The use of mobile learning itself can facilitate students in accessing the learning media because it can be used anywhere and anytime (Sartika et al., 2024). The use of PBL-based learning media is a supporting material for students' learning styles today which is one of the current needs and which can be a learning process as an additional media by teachers with the support of the role of technology in education. Activities in PBL learning can make it easier for students to get various information in teaching materials. Through problem-based learning, of course, students can obtain information and learn how to build a problem framework, look more closely, collect data, analyze data and prepare arguments related to problem solving. This

makes students learn to utilize the potential that exists within them to see problems, solve problems and can create thinking that is not easily trusted, still trying to find mistakes or errors (Siti et al., 2023).

CONCLUSION

Based on the results of the study, it shows that the learning media developed by the teacher still has some shortcomings. This is the information researchers get in interviews and needs analysis questionnaires. So schools really need creative learning media for learning, especially PBL-based mobile learning in accordance with the independent curriculum. The implication of this research is that further researchers can develop learning media in the form of PBL-based mobile learning in accordance with the analysis of student needs.

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REFERENCES

- Agus, S. B., & Endang, J. T. (2021). Pelatihan pengembangan bahan ajar handout berbasis aplikasi canva bagi guru di sma baitul arqom. *ABDI Indonesia*, 1(1), 1–8. <http://jurnal.unmuhjember.ac.id/index.php/ABDI/article/view/5232>
- Elvani, H., Asrowi, & Ardianto, D. T. (2022). Analysis of Android-Based Educational Game Media Development Needs for Social Studies Learning in Elementary Schools. *JTP - Jurnal Teknologi Pendidikan*, 24(1), 1–8. <https://doi.org/10.21009/jtp.v24i1.22552>
- Eric, S. B., & Douglas, D. A. (2023). Effectiveness of problem-based learning strategy in improving teaching and learning of mathematics for pre-service teachers in Ghana. *Social Sciences and Humanities Open*, 7(1), 100453. <https://doi.org/10.1016/j.ssaho.2023.100453>
- Fitri, F., & Ardipal. (2021). Pengembangan Video Pembelajaran Menggunakan Aplikasi Kinemaster pada Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, 5(6), 6330–6338. <https://doi.org/10.31004/basicedu.v5i6.1387>
- Flavia, A. H. (2023). A comparison between problem-based conventional learning and creative problem-based learning on self-regulation skills: Experimental study. *Heliyon*, 9(9), e19512. <https://doi.org/10.1016/j.heliyon.2023.e19512>
- Frans, A. W., Dwi, D., Wendha, N., & Aji, W. (2023). *Development of inshot-based raga learning media on cultural diversity material for grade iii elementary school students of technology in education . Technological developments can certainly be used by humans to improve welfare and educate the life of nati*. 8(2), 275–287.
- Handayani, A., & Koeswanti, H. D. (2021). Meta-Analisis Model Pembelajaran Problem Based Learning (PBL) Untuk Meningkatkan Kemampuan Berpikir Kreatif. *Jurnal*

- Basicedu*, 5(3), 1349–1355. <https://doi.org/10.31004/basicedu.v5i3.924>
- Herlina, U., & Anwar, M. (2020). Pelatihan Multimedia Virtual Interaktif Berbasis Teks Deskripsi Untuk Pendidikan Guru Sekolah Dasar. *Seminar Nasional Pengabdian Kepada Masyarakat*, 2020(2017), 361–370. <http://journal.unj.ac.id/unj/index.php/snppm>
- Herlina, U., Nina, N., & Yulia, E. S. Y. (2023). The Use Of Canva Application To Developing Integrated Language Skills Teaching Materials Based On Local Wisdom. *European Journal of Humanities and Educational Advancements (EJHEA) Available Online At*., 4(10), 68–72.
- Inayah, I. S. (2023). Peran Media Pembelajaran “Papan Pintar” Pada Mata Pelajaran IPA Di Sekolah Dasar. *Jurnal Ilmiah Pendidikan Dasar*, 13(1), 104–116.
- Indriani, S. M., Artika, W. I., & Ningtias, W. R. D. (2021). Penggunaan Aplikasi Articulate Storyline Dalam Pembelajaran Mandiri Teks Negosiasi. *Jurnal Pendidikan Bahasa Dan Sastra Indonesia*, 11(1), 25–36.
- Jairina, S. N. I., Handoyo, B., & Astina, I. K. (2020). Pengaruh Model Pembelajaran Problem Based Learning Terhadap Kemampuan Pemecahan Masalah Mitigasi Bencana. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 5(2), 225. <https://doi.org/10.17977/jptpp.v5i2.13182>
- Jumriani, Syaharuddin, Hadi, N. T. F. W., Mutiani, & Abbas, E. W. (2021). Efektivitas Model Problem Based Learning terhadap Kemampuan Pemecahan Masalah Matematika Siswa Sekolah Dasar. *Jurnal Basicedu*, 5(3), 1120–1129. <https://jbasic.org/index.php/basicedu/article/view/896>
- Junaidi. (2020). Implementasi Model Pembelajaran Problem Based Learning Dalam Meningkatkan Sikap Berpikir Kritis. *Jurnal Socius*, 9(1), 25. <https://doi.org/10.20527/jurnalsocius.v9i1.7767>
- Khoir, M. H., Murtinugraha, R. E., & Musalamah, S. (2020). Pengembangan Media Pembelajaran E-Learning Berbasis Moodle Pada Mata Kuliah Metodologi Penelitian. *Jurnal PenSil*, 9(1), 54–60. <https://doi.org/10.21009/jpensil.v9i1.13453>
- Khoiruman, M. A., & Banyuwangi, A. K. (2021). Analisis Hambatan Pembelajaran Bahasa Indonesia di Sekolah Dasar. *Kajian Linguistik*, 9(2), 51–62. <https://doi.org/10.35796/kaling.9.2.2021.38949>
- Kurniawati, D., & Ekayanti, A. (2020). Pentingnya Berpikir Kritis Dalam Pembelajaran Matematika. *Jurnal Penelitian Tindakan Kelas Dan Pengembangan Pembelajaran*, 3(2), 112.
- Maheni, N. P. K. (2019). Pengaruh Gaya Belajar Dan Lingkungan Teman Sebaya Terhadap Hasil Belajar Mahasiswa Di Jurusan Pendidikan Ekonomi Universitas Pendidikan Ganesha. *Jurnal Pendidikan Ekonomi Undiksha*, 11(1), 85. <https://doi.org/10.23887/jjpe.v11i1.20077>
- Mardhiyah, R. H., Aldriani, S. N. F., Chitta, F., Muhamad, & Rizal, Z. uhamad. (2021). Pentingnya Keterampilan Belajar di Abad 21 sebagai Tuntutan dalam Pengembangan Sumber Daya Manusia. *Jurnal Pendidikan*, 71(1), 63–71.
- Maulida, A. S. (2020). Penerapan Model Pembelajaran Problem Based Learning Untuk Meningkatkan Kemampuan Berfikir Kritis Siswa Kelas V Sekolah Dasar. *Jurnal Pendidikan Dan Konseling (JPDK)*, 2(1), 92–98. <https://doi.org/10.31004/jpdk.v1i2.602>
- Meng, C. K., Yu, H. Y., & Yu, X. W. (2023). The study on designed gamified mobile learning model to assess students’ learning outcome of accounting education. *Heliyon*, 9(2). <https://doi.org/10.1016/j.heliyon.2023.e13409>
- Minasari, U., & Susanti, R. (2023). Penerapan Model Problem Based Learning Berbasis Berdiferensiasi berdasarkan Gaya Belajar Peserta Didik pada Pelajaran Biologi. *Ideguru: Jurnal Karya Ilmiah Guru*, 8(2), 282–287.

- <https://doi.org/10.51169/ideguru.v8i2.543>
- Muhammad, S., & Henny, D. K. (2021). Pembelajaran Problem based learning Terhadap Berpikir Kritis Peserta Didik Sekolah Dasar. *MIMBAR PGSD Undiksha*, 9(3), 489–496. <https://doi.org/10.23887/jjpgsd.v9i3.41099>
- Mulabbiyah, Ismiati, & Ahmad, S. (2019). Penerapan Model Pembelajaran Fleming-VAK (Visual , Auditory , Kinesthetic) Untuk Meningkatkan Hasil Belajar Siswa Kelas IV MI Thohir Yasin Pada Muatan Pelajaran IPA. *El-Midad Jurnal Jurusan PGMI*, 10(1), 60.
- Nofita, U., Sri, W., & Ulin, N. (2023). Development of E-Modules Based On Mobile Learning Applications to Improve Students' Critical Thinking Skills in Science Subject. *JPPS (Jurnal Penelitian Pendidikan Sains)*, 12(2), 122–137. <https://doi.org/10.26740/jpps.v12n2.p122-137>
- Noni, A., Ilza, M., Ifan, I., & Made, R. N. (2022). Mobile Learning Application: Infusing Critical Thinking in the EFL Classroom. *Studies in English Language and Education*, 9(2), 724–743. <https://doi.org/10.24815/siele.v9i2.23476>
- Nuraeni, E., Hanapiah, E., & Yanti Ulpah, N. (2022). Pengaruh Penerapan Model Pembelajaran Klasikal pada Aspek Perkembangan Anak Usia Dini di TK Al Falah. *Edu Happiness : Jurnal Ilmiah Perkembangan Anak Usia Dini*, 1(2), 80–85. <https://doi.org/10.62515/eduhappiness.v1i2.75>
- Nurul, H., & Mukhayyarotin, N. R. J. (2021). Meta-Analysis of Students' Critical Thinking Skills Improvement on Physics Learning. *Berkala Ilmiah Pendidikan Fisika*, 9(2), 155. <https://doi.org/10.20527/bipf.v9i2.10585>
- Pratiwi, K. S., & Dzakiyah, N. Q. (2024). QR Code-Based Digital Media for Scientific Literacy Skills Enhancement of Elementary School Students. *JTP - Jurnal Teknologi Pendidikan*, 26(1), 63–83. <https://doi.org/10.21009/jtp.v26i1.43285>
- Purbasari, I., Ismaya, E. A., Suryani, N., & Djono, D. (2019). Media Pembelajaran Ilmu Pengetahuan Sosial Berbasis Aplikasi Mobile Learning bagi Siswa Sekolah Dasar. *Jurnal Sejarah, Budaya, Dan Pengajarannya*, 13(1), 97–106. <https://doi.org/10.17977/um020v13i12019p97>
- Purosad, A., Darmawan, D., & Ratnasafitri, E. (2020). Implementasi Model Pembelajaran Mobile Learning Berbasis Androind Dalam Meningkatkan Prestasi Belajar Siswa Pada Pembelajaran Bahasa Inggris: Degrees Of Comparison. *Gunahumas*, 3(2), 57–72.
- Razilu, Z. (2021). Pengembangan Mobile Learning Berbasis Android Menggunakan Articulate Storyline 3 Di Sekolah Dasar. *Decode: Jurnal Pendidikan Teknologi Informasi*, 1(1), 17–21. <https://doi.org/10.51454/decode.v1i1.3>
- Robert, M. B. (2009). *Instructional Design: The ADDIE Approach*. Springer. <https://doi.org/10.1007/978-0-387-0950-6>
- Salma, A. H., Cahya, P. E., Rika, R. A., Selly, F., & Ahmad, S. (2022). Development of Android-based Interactive Multimedia to Enhance Critical Thinking Skills in Learning Matters. *Journal of Science Learning*, 5(1), 103–114. <https://doi.org/10.17509/jsl.v5i1.33998>
- Samoekan, S. (2021). Features, barriers, and influencing factors of mobile learning in higher education: A systematic review. *Heliyon*, 7(4), e06696. <https://doi.org/10.1016/j.heliyon.2021.e06696>
- Sarah, S. . T. (2021). Penerapan Model Pembelajaran Problem Based Learning (PBL) untuk Meningkatkan Hasil Belajar IPS di SD Sarah. *Jurnal Ilmiah Wahana Pendidikan*, 7(1), 41. <https://doi.org/10.5281/zenodo.4539955>
- Sartika, S. B., Suyidno, & Akbar Wiguna. (2024). The Analysis of Students Needed in Digital Teaching Media. *JTP - Jurnal Teknologi Pendidikan*, 26(1), 44–62. <https://doi.org/10.21009/jtp.v26i1.40737>

- Suarni, N., Taufina, T., & Zikri, A. (2019). Literasi Membaca Meningkatkan Karakter Positif Siswa Sekolah Dasar. *Jurnal Basicedu*, 3(4), 1014–1021. <https://doi.org/10.31004/basicedu.v3i4.215>
- Suhardi, Astuti, I., & Suratman, D. (2022). Development of Mobile Learning Based on a Scientific Approach To Learning. *Jurnal Scientia*, 10(02), 291–301.
- Supiadi, E., Sulisty, L., Rahmani, S. F., Riztya, R., & Gunawan, H. (2023). Efektivitas Model Pembelajaran Terpadu dalam Meningkatkan Kemampuan Berpikir Kreatif dan Hasil Belajar Siswa di Sekolah. *Journal on Education*, 5(3), 9494–9505.
- Supit, D., Melianti, M., Lasut, E. M. M., & Tumbel, N. J. (2023). Gaya Belajar Visual, Auditori, Kinestetik terhadap Hasil Belajar Siswa. *Journal on Education*, 5(3), 6994–7003. <https://doi.org/10.31004/joe.v5i3.1487>
- Trimahesri, I., & Hardini, A. T. A. (2019). Peningkatan Kemampuan Berpikir Kritis dan Hasil Belajar Pada Mata Pelajaran Matematika Menggunakan Model Realistic Mathematics Education. *Thinking Skills and Creativity Journal*, 2(2), 111–120.
- Utomo, J., & Burhan. (2021). Analisis Pembelajaran Student Teams Achievement Divisions untuk Meningkatkan Motivasi Belajar Mahasiswa PGSD Universitas Madako Tolitoli. *Journal of Elementary School (JOES)*, 4(1), 91–98. <https://doi.org/10.31539/joes.v4i1.2302>
- Yeni, N., Khairunisa, Y., & Kuswoyo, D. (2022). Development of Interactive Digital Learning Multimedia Applications as Independent Learning Module in 2-Dimensional Game Programming Courses. *JTP - Jurnal Teknologi Pendidikan*, 24(3), 307–321. <https://doi.org/10.21009/jtp.v24i3.29769>