

The Effect of Mangats Application in Improving Social Studies Learning Outcomes at SMP Negeri 11 Malang

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Abstract

This study aims to determine the effect of the application of Mangats (Modul Semangat Nasionalisme) on improving student learning outcomes in the subject of Social Studies at SMP Negeri 11 Malang. The background of this research is social studies learning that is considered less interesting by students because it is theoretical and less relevant to everyday life, so that the learning provided by teachers tends to be limited to textbooks. The lack of innovation in the learning process makes students less interested in learning the material. This results in many students experiencing a decrease in interest in learning and low learning outcomes, especially in material about the lives of Indonesian people during colonialism and imperialism. This study used a quantitative approach with a quasi-experimental design through pretest and posttest measurements on two groups, namely the experimental group that used the Mangats application and the control group that did not use it. Data were collected through observation, questionnaires, and tests. The data were analyzed using Paired Sample T-test to see the difference in pretest and posttest results in both groups. The results of the analysis showed that the use of the Mangats application significantly improved student learning outcomes, with the average value of the posttest being much higher than the pretest. This shows that the Mangats application is effective in increasing students' interest and understanding in Social Studies subjects at SMP Negeri 11 Malang.

Keywords: Mangats App, Learning Outcomes, and Social Studies

1. INTRODUCTION

Education is a series of processes to prepare good and competent human resources according to their talents and interests. Education is a very important foundation in building quality, superior, and competitive human resources (Khorofi, 2022). One of the school subjects that can prepare good and competent human resources is Social Studies (IPS). Social studies is a subject that integrates various disciplines of social sciences and humanities. Social studies demands understanding of concepts, social analysis, and critical analysis of students (Pasaribu, 2024). Social studies examine events, facts, concepts, and generalizations related to social issues (Aulia & Wandini, 2023). So that social studies learning is always related to students' daily lives to prepare students as social actors who can participate in solving problems and become good citizens (Bani et al., 2023; Isnaeni & Ningsih, 2021). Based on this, social studies is one of the important subjects for students to learn and understand.

Social studies subjects at the junior high school level consists of geography, history, economics, and sociology combined into one unit. In addition to understanding the concept, social studies subjects are designed to develop the ability to analyze the social conditions of

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society by looking from various perspectives of social science disciplines and humanities (Nisa et al., 2024). However, social studies is seen as a boring subject because it is considered too much memorized material that is less relevant to students' daily lives (Febriani, 2021; Nahla et al., 2023). Social studies material consisting of various social science and humanities disciplines is also considered too broad and abstract so that students sometimes have difficulty in understanding the essence of the social studies topic being taught (Utami & Gularso, 2024). In addition, teachers in explaining also sometimes use the lecture method which tends to be boring and has limitations in the application of innovative learning media (Syahwana, 2022). Constraints in social studies learning can affect student learning outcomes so that there is a need for improvement in the social studies learning process.

The form of improvement that teachers can do is to apply innovative learning media. Learning media is a tool in the teaching and learning process made by the teacher with the aim of increasing student interest in learning and active student participation during the learning process (Irsan et al., 2021). Examples of learning media that teachers apply in learning such as textbooks, audiovisual media, image media, interactive media, virtual reality and augmented reality media, online and e-learning media, teaching aids, and so on. Several studies that have been conducted state that the application of interesting and innovative learning media can improve the quality of learning and student learning outcomes, such as the application of Powtoon media in learning can create an exciting learning atmosphere (Sholikhati & Astuti, 2023). The application of puzzle media in fraction teaching materials shows an increase in student interest in the learning process (Antoro et al., 2023). The utilization of online learning media is one of the efforts made in improving student learning outcomes (Murtado et al., 2023), and the application of digital comic learning media can improve student learning outcomes (Narestuti et al., 2021).

SMP Negeri 11 Malang in learning social studies also experienced similar obstacles, especially in the application of interesting and innovative learning media. Based on observations, many students experienced a decrease in learning outcomes on the material of the life of Indonesian society during colonialism and imperialism. This happens because the majority of material that contains events in the past can not be understood by students because students feel irrelevant to their daily lives which also has an impact on decreasing student interest in learning. In order to improve the interest and learning outcomes of students of SMP Negeri 11 Malang in social studies material on the life of Indonesian society during colonialism and imperialism can be done by applying innovative learning media. Innovative learning media applied at SMP Negeri 11 Malang is the application Mangats (Module Spirit of Nationalism) which is an innovative product development of learning media. Therefore, this study aims to determine the effect of the application of Mangats in improving student social studies learning outcomes at SMP Negeri 11 Malang.

2. METHOD

This research uses a quantitative approach with experimental methods. The experimental method aims to test the effect of independent variables on the dependent variable or to explain certain relationships, including causal relationships (Sugiyono, 2011). This research design is a quasi-experimental with a non-equivalent group design, which functions to compare pretest

and posttest scores to see changes after the application of a new approach (Syahfitri et al., 2022). In this design, there are two groups, namely the control group and the experimental group. The research subject was class 8A at SMP Negeri 11 Malang with 32 students as the sample. Data analysis was conducted with the Paired Sample T-test to evaluate the effectiveness of the intervention by looking at the average difference after implementation (Sugiyono, 2015). The sampling technique used was a saturated sample, so that the entire population became the research sample. Data collection techniques include observation, questionnaires, tests, and documentation. The tests given were in the form of pretest and posttest, where the pretest was conducted before the teaching and learning process to determine the initial ability of students, and the posttest was given after the learning process to measure the improvement of students' understanding.

3. RESULT AND DISCUSSION

Analysis of Student Learning Outcomes

The results of the pretest and posttest conducted in class 8A SMP Negeri 11 Malang on social studies material Theme 3 "Nationalism and National Identity" Subtheme "How was the Life of Indonesian Society during the Period of Colonialism and Imperialism?" can be seen in Table 1. The pretest results before using the Mangats Application show the average score is 47.34 with the highest score is 71 and the lowest score is 23. Meanwhile, the posttest results after using the Mangats Application show the average score is 97.47 with the highest score is 100 and the lowest score is 94.

Table 1. Pretest and Posttest Results of 8A Students SMP Negeri 11 Malang

No	Name	Pre-test	Post-test
1	Aathirah Charensa Putri	70	98
2	Afika Dwi Saputri	47	100
3	Ahmad Riski Ramadan	52	95
4	Alfian Adhe Rahmawan Putra	53	98
5	Anaza Shafiyah	61	100
6	Aryasatya Felda Ardhani Zakaria	50	98
7	Aulia Zahronita	25	98
8	Azahra Alya Wibisono	23	95
9	Azzam Fakhrullah Setiawan	49	94
10	Diamond Tri Arlin	27	98
11	Caskaya Avara Chandani	56	96
12	Cheryl Kayla Aznii	64	98
13	Danish Adriansyah Baktiar	71	98
14	Dara Vidya Kirana	67	98
15	Dwi Candra Hermawan	28	96
16	Eko Putra Satrio Wicaksono	29	98
17	Eldanu Surya Putra Yanuariza	32	99
18	Exsya Sultan Fushshilat	71	98
19	Fawnia Aisy Nikeyla	67	96
20	Lollyta Ariatna Salsabilla	35	96
21	Muhammad Maulidin	36	94

22	Nayla Kirania Zaafarani	62	98
23	Nazwa Laila Zahira	50	100
24	Nirviana Bintang Alifya Azzahrawati	48	98
25	Pambudi Daya	29	95
26	Paquita Cherelia Kanza	30	96
27	Radhitya Bagas Seno Aji	41	100
28	Rafa Keandra Azka Putra	49	98
29	Reyhan Abdi Saputra	33	96
30	Rizky Ramadhan	38	99
31	Vanesa Putri Sayudi	67	98
32	Vevila Edria Puteri	55	100

Source: Analysis Results, 2024

Data analysis in this study used the Paired Sample T-test for comparison. This approach is used to assess the success of a treatment and identify the average of two paired samples. The hypothesis was tested by comparing the average pretest and posttest results. In testing the hypothesis, the results of the Paired Sample T-test analysis are as follows:

Table 2. Paired Sample Statistics

Pair 1		Mean	N	Std. Deviation	Std Error Mean
	Pretest	47,34	32	15.431	2.728
	Postes	97,47	32	1.759	.311

According to the statistical analysis described earlier, the average score at the pretest stage was 47.34 while the average at the posttest stage was 97.47. This indicates an increase and positive effect after the application of the Modul Semangat Nasional (MANGATS) in social studies subjects.

From the correlation test results in Figure 2, a significant value of 0.125 was obtained, which exceeds the threshold of 0.05. In accordance with the decision-making guidelines in the correlation test, this illustrates that there is no significant relationship between the pretest and posttest.

Table 3. Paired Sample Correlations

	N	Correlations	Significance	
			One-sided p	Two-sided p
Pair 1 Pretest& Postes	32	.277	0.063	.125

Table 3 shows the results of the Paired Sample T-test where a significant value of $0.001 < 0.05$ was obtained, it can be concluded that there is a difference in the average student learning outcomes for the pretest and posttest classes. Decision making regarding whether or not the hypothesis test is accepted is carried out at the 5% or 0.05 significance level. The results of hypothesis testing obtained a significance value of 0.001 where 0.001 is less than or smaller than 0.05 so that H_0 is rejected and H_a is accepted, illustrating that there is a significant difference between student learning outcomes on pretest and posttest data in terms of the application of the Modul Semangat Nasionalisme (MANGATS) in social studies subjects.

Table 4. Paired Sample Test

	t	df	Significance	
			One-sided p	Two-sided p
Pair 1 Pretest& Postes	-18.854	31	< 0.001	<.000

Mangats App (Modul Semangat Nasionalisme Application)

Mangats (Modul Semangat Nasionalisme) is an innovative product development in the form of learning media that utilizes the I Spring Suite computer program. I Spring Suite is a simple application creation software that is integrated with Microsoft Power Point and can be collaborated with several other supporting software (Lestari & Kurniawan, 2023). I Spring Suite provides various features such as animation, images, audio, video, assessment, interaction, role play, screen recording, YouTube and Web Object, narration and others. The results of learning media created through I Spring Suite are in flash and HTML 5 format. The resulting format can be accessed properly through laptops and smartphones. So that I Spring Suite can be used to create interactive learning media.

The teaching material developed in the Mangats App is Theme 3 "Nationalism and National Identity" Subtheme "How did Indonesian People Live during Colonialism and Imperialism?". This subtheme contains several topics such as the arrival of westerners in Indonesia, resistance to trade alliances, resistance to the Dutch East Indies Government, and the Japanese occupation. Based on the results of observations and filling out questionnaires conducted by students, the material is one of the materials that is difficult for students to master and students tend to get bored if they only learn through textbooks. This happens because the majority of the material is memorized material with many events that occur.

The Mangats application contains all the material on the subtheme which is packaged more interactively. The Mangats application contains content in the form of instructions for use, description of learning activities, teaching materials, practice questions, learner activity sheets, and self-reflection (Figure 1.). The description of learning activities contains an introduction and learning objectives. Teaching materials are provided in the form of text, video, and news. In addition, there are also interactive practice questions in the form of "Pasangkan!" and "Tebak Gambar".

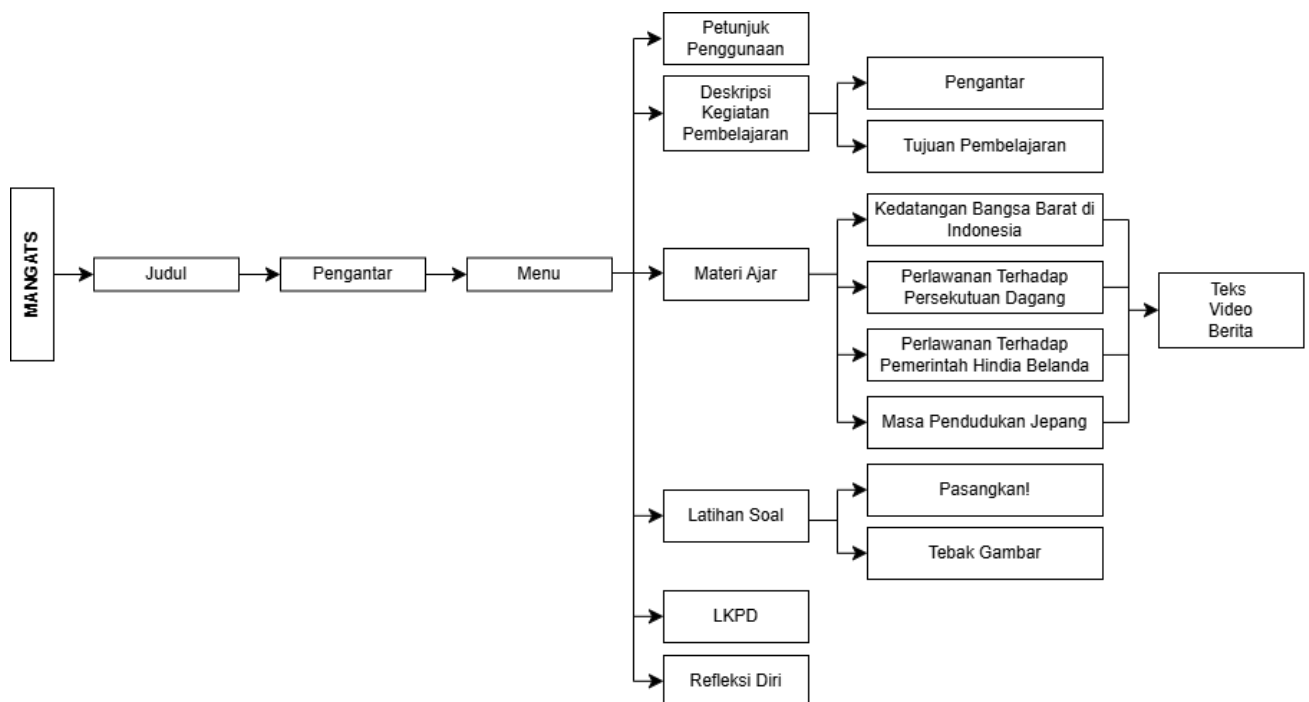


Figure 1. Mangats App Design

The Effect of Mangats Application in Social Studies Learning at SMP Negeri 11 Malang

Based on the results of observations that have been made at SMP Negeri 11 Malang shows that social studies material that is less interesting and difficult to understand is the material about the life of Indonesian society during colonialism and imperialism. This happens because this material is dominated by the memorization of events and teachers have difficulty in linking the material with the daily lives of students and the learning provided by the teacher is limited to textbooks. The lack of innovation in learning causes students to be less interested in learning the material (Ulfiah & Wahyuningsih, 2023; Prasetya et al., 2024). This certainly affects student learning outcomes as evidenced in several classes that have completed the material showing student learning outcomes that are still below the minimum completeness criteria.

The Mangats application is an interactive learning media innovation in the form of a simple module application that is expected to help students understand the material and be able to improve student learning outcomes. The application of the Mangats application has been carried out at SMP Negeri 11 Malang in class 8A with 32 regular students. Based on the pretest results (Table 1 and Figure 1) to determine students' initial knowledge of the material, it shows that the average score is low and far from the minimum completeness criteria.

The Mangats application as a form of learning media innovation that utilizes technology is able to attract students' interest in learning the material. This happens because the Mangats application can accommodate the different needs of each student, namely by providing various choices of teaching materials such as text, video, and news. Teaching materials in the form of text contain brief and to the point material to make it easier for students to understand each event that occurs. Students with audiovisual learning styles are also facilitated by the presence of videos in each material or events that occur. In addition, the current news that links events that occurred in the past with the present also makes it easier for students to build knowledge of the material. Learning carried out by applying the Mangats application becomes more meaningful to students and increases students' interest in learning. The existence of interesting practice questions and LKPD which are not only limited to multiple choice or essays also makes students feel more interested and eager to test their understanding of the material that has been learned. Self-reflection at the end of learning also provides benefits for students in developing the learning process they have done where this can motivate students to be able to further understand the material that they think is difficult to understand.

The application of Mangats application in social studies learning at SMP Negeri 11 Malang has a significant influence and impact on student learning outcomes. This is evidenced by the results of the posttest conducted by students increased significantly and the majority of students have reached the minimum completeness criteria and there is an increase in social studies learning outcomes of students of SMP Negeri 11 Malang. This is in line with previous research where the application of innovative learning media innovations has proven to be able to create a pleasant learning atmosphere. (Sholikhati & Astuti, 2023) and attract student interest (Antoro et al., 2023) so that meaningful learning occurs and can improve student learning outcomes (Murtado et al., 2023; Narestuti et al., 2021).

The integration of digital tools in education has significantly transformed the way students engage with learning materials. One such tool, the Mangats application, has been explored for

its potential in enhancing Social Studies learning outcomes at SMP Negeri 11 Malang. The primary objective of the study was to assess how Mangats, a mobile-based application designed to facilitate interactive learning, impacts students' academic performance in Social Studies.

The findings indicate that the use of Mangats led to a noticeable improvement in students' learning outcomes. This could be attributed to the application's interactive features, which encourage active participation and engagement. Zabolotskikh et al. (2021), by offering a platform for students to access learning materials, collaborate with peers, and test their knowledge through quizzes and assessments, Mangats helps make learning more dynamic and personalized. This active involvement likely promotes deeper understanding and retention of Social Studies concepts (Heafner & Friedman, 2008). The application's design, which includes visual aids, videos, and interactive tasks, aligns with constructivist learning principles, where students build knowledge through experiences and reflections (Al Abri et al, 2024: Yoders, 2014). These features not only cater to different learning styles but also provide opportunities for self-paced learning, empowering students to take control of their educational progress.

The study highlighted that students who used Mangats exhibited better motivation and engagement in Social Studies lessons. This is consistent with previous research that suggests educational apps can foster intrinsic motivation by making learning more enjoyable and relevant to students' lives (Oudeyer et al., 2016). The results also show that teachers observed a shift in classroom dynamics, with more students actively participating and showing improved comprehension during discussions. This suggests that Mangats does not only impact individual learning outcomes but also enhances classroom interaction and collaboration, contributing to a more engaging learning environment.

However, it is important to note that the application's effectiveness may vary depending on factors such as the students' initial familiarity with technology, the quality of internet access, and the teacher's ability to integrate the application effectively into the curriculum. Therefore, while Mangats offers promising benefits, its full potential can only be realized when these factors are properly addressed.

The Mangats application has proven to be an effective tool in improving Social Studies learning outcomes at SMP Negeri 11 Malang. The application not only enhances students' academic performance but also fosters a more engaging, collaborative, and individualized learning experience. Moving forward, integrating such digital tools into other subjects and schools could further support the development of 21st-century learning skills.

4. CONCLUSION

The application of the Mangats application has an effect on improving student learning outcomes in Social Science (IPS) subjects at SMP Negeri 11 Malang. The results of the analysis showed a significant increase in the average posttest score which was much higher than the pretest score after using the Mangats application, with the average posttest score reaching 97.47 while the pretest was only 47.34. The Mangats application helps overcome students' boredom with social studies material, especially on material about the life of Indonesian society during colonialism and imperialism, which was previously considered less interesting and relevant by students. The use of technology-based interactive learning media,

such as the Mangats application, can significantly increase students' interest and understanding of social studies materials. Recommendations for future research can focus on the effect of the Mangats application or similar media on various student learning styles in social studies subjects, given the diversity of learning styles that students have.

REFERENCES

- Al Abri, M. H., Al Aamri, A. Y., & Elhaj, A. M. A. (2024). Enhancing student learning experiences through integrated constructivist pedagogical models. *European Journal of Contemporary Education and E-Learning*, 2(1), 130-149. [https://doi.org/10.59324/ejceel.2024.2\(1\).11](https://doi.org/10.59324/ejceel.2024.2(1).11)
- Antoro, B., Amelia, M. M., Hakim, L., & Rozi, F. (2023). Inovasi Media Pembelajaran Matematika Menggunakan Puzzle untuk Meningkatkan Minat Belajar Siswa SDN 064024 Medan. *Madaniya*, 4(1), Article 1. <https://doi.org/10.53696/27214834.372>
- Aulia, R., & Wandini, R. R. (2023). Karakteristik Mata Pelajaran IPS. *Jurnal Pendidikan Dan Konseling (JPDK)*, 5(2), 4034–4040. <https://doi.org/10.31004/jpdk.v5i2.13889>
- Bani, E. A. S., Winandar, M. L., & Rustini, T. (2023). Peran Pembelajaran IPS Dalam Membentuk Karakter dan Budaya Bangsa Pada Anak Sekolah Dasar. *Journal on Education*, 5(2), Article 2. <https://doi.org/10.31004/joe.v5i2.803>
- Febriani, M. (2021). IPS Dalam Pendekatan Konstruktivisme (Studi Kasus Budaya Melayu Jambi). *Aksara: Jurnal Ilmu Pendidikan Nonformal*, 7(1), Article 1. <https://doi.org/10.37905/aksara.7.1.61-66.2021>
- Heafner, T. L., & Friedman, A. M. (2008). Wikis and constructivism in secondary social studies: Fostering a deeper understanding. *Computers in the Schools*, 25(3-4), 288-302. <https://doi.org/10.1080/07380560802371003>
- Irsan, I., G, A. L. Nurmaya., Pertiwi, A., & R, F. (2021). Pelatihan Pembuatan Media Pembelajaran Inovatif Menggunakan Canva. *Jurnal Abdidas*, 2(6), 1412–1417. <https://doi.org/10.31004/abdidas.v2i6.498>
- Isnaeni, Y., & Ningsih, T. (2021). Pembentukan Karakter Peduli Sosial Melalui Pembelajaran IPS. *JISIP (Jurnal Ilmu Sosial Dan Pendidikan)*, 5(3), Article 3. <https://doi.org/10.58258/jisip.v5i3.2255>
- Khorofi, M. (2022). Pengembangan SDM Unggul di Era Revolusi Industry 4.0 Perspektif Islam. *AL -ALLAM*, 3(1), 34–42. <https://doi.org/10.35127/jurnalpendidikan.v3i1.5650>
- Lestari, D. M., & Kurniawan, A. W. (2023). Aplikasi iSpring Suite sebagai media pembelajaran pada materi kebugaran jasmani: Sebuah studi pengembangan. *Jurnal Olahraga Pendidikan Indonesia (JOPI)*, 3(1), Article 1. <https://doi.org/10.54284/jopi.v3i1.281>
- Murtado, D., Hita, I. P. A. D., Chusumastuti, D., Nuridah, S., Ma'mun, A. H., & Yahya, M. D. (2023). Optimalisasi Pemanfaatan Media Pembelajaran Online Sebagai Upaya Meningkatkan Hasil Belajar Siswa di Sekolah Menengah Atas. *Journal on Education*, 6(1), Article 1. <https://doi.org/10.31004/joe.v6i1.2911>

- Nahla, Z., Setiawan, B., & Ulandari, T. (2023). Kurangnya Ketertarikan Siswa Terhadap Mata Pelajaran IPS di Tingkat SMP. *JURNAL PENDIDIKAN DAN ILMU SOSIAL (JUPENDIS)*, 2(1), 88–101. <https://doi.org/10.54066/jupendis.v2i1.1181>
- Narestuti, A. S., Sudiarti, D., & Nurjanah, U. (2021). Penerapan Media Pembelajaran Komik Digital untuk Meningkatkan Hasil Belajar Siswa. *Bioedusiana: Jurnal Pendidikan Biologi*, 6(2), Article 2. <https://doi.org/10.37058/bioed.v6i2.3756>
- Nisa, A., Fajriah, A. N., & Sabila, S. A. (2024). Pembukaan Jendela Dunia: Peran Pembelajaran IPS dalam Pengembangan Siswa Kelas Awal. *Sindoro: Cendikia Pendidikan*, 4(7), Article 7. <https://doi.org/10.9644/sindoro.v4i7.3409>
- Oudeyer, P. Y., Gottlieb, J., & Lopes, M. (2016). Intrinsic motivation, curiosity, and learning: Theory and applications in educational technologies. *Progress in brain research*, 229, 257-284. <https://doi.org/10.1016/bs.pbr.2016.05.005>
- Pasaribu, S. A. (2024). Analisis Problematika Pembelajaran Ilmu Pengetahuan Sosial di Sekolah Dasar Muhammadiyah 12 Medan. *International Journal of Education, Conseling and Multidicipline (IJEDUCA)*, 1(2), Article 2. <https://multieducatif.org/index.php/ijeduca/article/view/7> .
- Prasetya, S. P., Hidayati, A., Farid, J. A., Listari, T., Ardiansyah, R., & Chanthoeurn, D. (2024). Development of Augmented Reality Atlas Volcano Series Media in Social Sciences Learning. *TEM Journal*, 13(4). <https://10.18421/TEM134-47>
- Sholikhathi, N. I., & Astuti, N. (2023). Peningkatan Kualitas Pembelajaran Dengan Media Powtoon. *ENGAGEMENT: Jurnal Pengabdian Masyarakat*, 2(2), Article 2. <https://doi.org/10.58355/engagement.v2i2.26>
- Sugiyono. (2011). Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D. *Alfabeta*.
- Sugiyono. (2015). Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif dan R&D. *Alfabeta*.
- Syahfitri, R., Kusumawati, T. I., & Rambe, R. N. (2022). Pengaruh Model Pembelajaran Contextual Teaching And Learning (CTL) terhadap Hasil Belajar Siswa pada Mata Pelajaran IPS. *Jurnal Pendidikan Dan Konseling (JPDK)*, 4(6), 1079–1088. <https://doi.org/10.31004/jpdk.v4i6.8324>
- Syahwana, A. (2022). Kendala Guru dalam Mengajarkan Pembelajaran IPS Terpadu Kelas VIII MTs Swasta At-Taufiqurrahman Labuhanbatu Utara. *PENDIS (Jurnal Pendidikan Ilmu Sosial)*, 1(1), Article 1. <https://doi.org/10.61721/pendis.v1i1.6>
- Ulfiah, Z., & Wahyuningsih, Y. (2023). Penerapan Permainan Edukatif Teka Teki Silang Dalam Meningkatkan Motivasi Belajar Siswa Sekolah Dasar. *Dirasah : Jurnal Studi Ilmu Dan Manajemen Pendidikan Islam*, 6(2), Article 2. <https://doi.org/10.58401/dirasah.v6i2.928>
- Utami, D. T., & Gularso, D. (2024). Kesulitan Belajar IPS pada Siswa Sekolah Dasar pada Kurikulum Merdeka: Studi pada SD Negeri Tukangan Yogyakarta. *Pendas : Jurnal Ilmiah Pendidikan Dasar*, 9(03), Article 03. <https://doi.org/10.23969/jp.v9i03.17855>

- Yoders, S. (2014). Constructivism Theory and Use from 21 st Century Perspective. *Journal of Applied Learning Technology*, 4(3), 10-20. https://nsuworks.nova.edu/hpd_hs_facarticles/170
- Zabolotskikh, A., Zabolotskikh, A., Dugina, T., & Tavberidze, D. (2021). Creating individual learning paths in the Moodle plugin for undergraduate students to study English grammar. *Education and Information Technologies*, 26(1), 617-637. <https://doi.org/10.1007/s10639-020-10278-1>