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The Influence of Using Learning Media Assisted by *Smart Apps Creator* (SAC) on Students' Cognitive Learning Outcomes on the Human Circulatory System Material

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Abstract: This research aims to determine the effect of using learning media assisted by Smart Apps Creator (SAC) on students' cognitive learning outcomes on the human circulatory system material at SMP Negeri 2 Suwawa. The research method used in this study was an experiment using a One Group Pretest-Posttest Design with a population of all VIII grade students of SMP Negeri 2 Suwawa. The sample consists of 3 classes, namely the experimental class, replication 1 and replication 2, with a purposive sampling technique. Data was obtained by statistical tests and inferential statistics, including normality tests, hypothesis tests, and N-Gain analysis. The results of the average acquisition of class VIII students were greater than the KKTP, shown by the average value of the experimental class of 84.48, replication class 1, 81.14 and replication class 2, 86.45, compared to the KKTP of 75. Based on the hypothesis testing criteria, where the t count in the experimental class was 10.969 compared to the t table of 2.045, replication class 1 obtained a t count of 6.710 with a t table of 2.074, and replication class 2 obtained a t_{count} of 9.569 with a t_{table} of 2.093. It can be concluded that the hypothesis testing in the three classes is that the t_{count} is greater than the t_{table}. This can be interpreted as the use of learning media assisted by Smart Apps Creator influences students' cognitive learning outcomes.

Keywords: Cognitive Learning Outcomes; Human Circulatory System; Smart Apps Creator Learning Media.

Introduction

Education plays an important role in preparing human resources today and in the future. Education requires strategies or methods that are easy for students to understand, especially in this era of rapid technological development, accompanied by the development of science and the intelligence of its users. The application of learning using technology must be carried out by a teacher in a directed manner to their students; for that, teachers must pay attention to good learning media for students so that they can influence the level of success of the students themselves [1].

One of the phenomena that is happening today is how close technology, in this case smartphones or Androids, is to our lives. In this regard, it is necessary to develop Android-based learning media. It is hoped that the developed learning media can create effective and interesting learning, so that it can improve student learning outcomes. One of the media that can support the development of Android-based learning is Smart Apps Creator (SAC) [2].

Smart Apps Creator (SAC) is a digital interactive media that can build multimedia content that can be installed on Android-based smartphones [3]. Creating mobile learning applications with SAC can be done because it does not require programming code. SAC is one of the means to create interactive learning media applications that are fun with easy-to-understand features, so that the process of creating media using this application can be done effectively and efficiently [4]. In addition, Android-based learning media made from the SAC application can be used offline without using up internet quota. The learning model must also support creative learning media; one of the learning models that can be used is the Discovery Learning learning model. Discovery learning is a learning model that encourages students to seek relevant sources of information and challenges them to become more independent [5]. Discovery Learning is a type of learning where students build their own knowledge by conducting an experiment and finding a principle from the results of the experiment [6]. The characteristics of the discovery learning model are exploring or solving problems to create, combine, and generalize knowledge; student-centered [7]. The Discovery Learning model has advantages, namely that students are actively involved in the learning process, learning activities in discovery learning are usually more meaningful than class exercises and studying textbooks alone [8]. This the discovery learning model is able to encourage student independence in learning and is believed to be able to make students more likely to remember concepts, data or information if they find it themselves [9].

Learning outcomes are a relatively permanent change in individual behavior as a result of interaction with the environment involving cognitive processes [10]. Cognitive learning outcomes are the values obtained by

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students after experiencing the learning process through learning outcome tests [11]. These learning outcomes are in the form of cognitive learning outcomes that include the dimensions of knowledge and the dimensions of cognitive processes [12].

Based on the results of observations and unstructured interviews with students in grade VIII, the learning process, especially in science material that still uses PowerPoint media and is directly explained, is considered boring, uninteresting and monotonous by students. The problem in learning using monotonous media like this tends to make students unfocused, which can cause them to just go in and out of class. So, through more interactive learning media, there is one effort in the learning process that can contribute to building a learning atmosphere that is not monotonous. The solution to the above problems is to use learning media assisted by Smart Apps Creator (SAC). The application of learning media assisted by SAC can improve students' thinking skills, and SAC-based learning, containing presentation slides, supporting videos, and relevant materials, is expected to provide convenience for students in the learning process.

Based on the background description above, the researcher is interested in conducting research with the title "The Effect of Using Learning Media Assisted by Smart Apps Creator (SAC) on Students' Cognitive Learning Outcomes on the Human Circulatory System Material"

Research Method

This type of research is experimental, and the research design used is a one-group pretest-posttest Design. The steps taken in experimental research are: 1) giving a pretest to the three classes; 2) giving the same treatment to the three classes using Smart Apps Creator (SAC) learning media; 3) giving a posttest to the three classes.

The population of this study was grade VIII students of SMP Negeri 2 Suwawa in the 2024/2025 academic year. The selected samples were class VIII-1 as the experimental class, VIII-2 as replication class 1, and VIII-3 as replication class 2. Use. The use of replication classes in this study is a repetition of the experimental class to ensure more accurate assessment and evaluate the consistency of student learning outcomes obtained [13] . The number of students in each sample group consists of different numbers, namely class VIII-1, 29 people, VIII-2, 22 people, and VIII-3, 19 people. The sample in this study was taken from a population of 70 people. Determination of sample groups is determined by the researcher.

The research instrument is a learning outcome test. The instrument used is in the form of an essay consisting of 10 questions covering the cognitive domain of levels C4, C5 and C6 with the aim of determining student learning outcomes.

The values obtained from the learning outcome test were then subjected to data analysis, including normality tests, hypothesis tests and n-gain tests to determine the effect of the treatment of using learning media assisted by Smart Apps Creator (SAC).

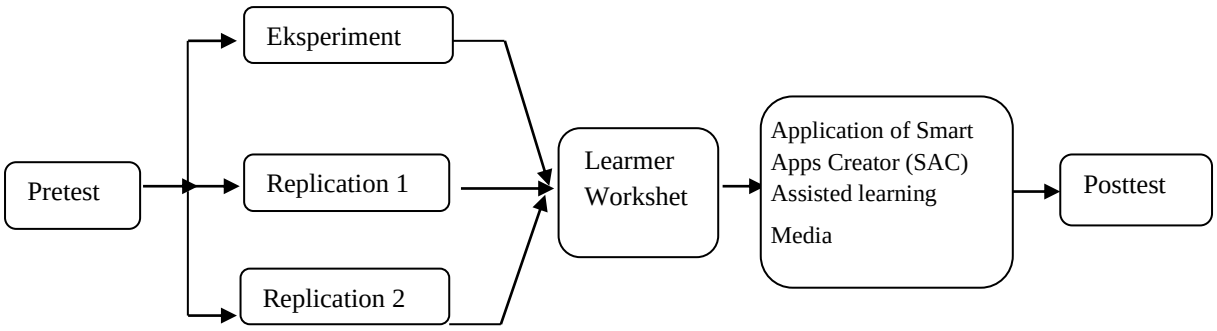

Figure 1. Research Flow Chart

Results and Discussion

The average student learning outcomes in Table 1 show differences between the average pretest-posttest scores for each class, be it the experimental class, replication 1 or replication 2. The average learning outcomes in the posttest of the three classes, both experimental and replication classes, exceeded the average learning outcomes in the pretest.

The results of students' cognitive domain learning are obtained from the results of tests carried out by students, which have been compiled based on question indicators and cognitive levels. The average of each achievement of the cognitive domain of students from cognitive levels C4, C5 and C6 in the experimental class can be seen in Figure 2.

Table 1. Results of the Calculation of Average Student Learning Outcomes

No.	Class	Average value	
		Pretest	Posttest
1.	Experiment	43.17	84.48
2.	Replication 1	43.18	81.14
3.	Replication 2	47.37	86.45

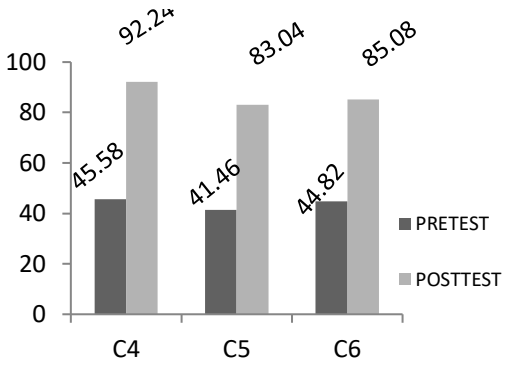

Figure 2. Average Student Learning Outcomes in the Experimental Class

The results of the average calculation of each cognitive level achievement C4, C5, and C6, are
At the cognitive level C6, there is also an increase of 40.28. So that at the cognitive level, C4 is higher compared to C5 and C6. Then, the average of each achievement of the cognitive domain of students in replication class 1 can be seen in Figure 3.

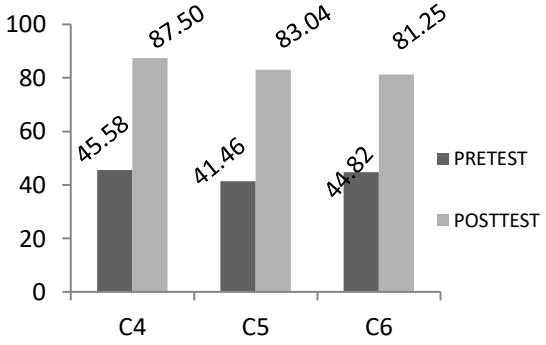

Figure 3. Average Student Learning Outcomes in Replication Class 1

In replication class 1, the results of the average calculation at each cognitive level, C4, C5 and C6, showed an increase from *pretest* to *posttest*. The cognitive level C4 increased by 41.92. The cognitive level C5 increased by 41.46, and at the cognitive level C6 increased by 36.43. So, in replication class 1, a higher increase occurred at the cognitive level C4 compared to the cognitive levels C5 and C6.

The average achievement of each cognitive domain of students from cognitive levels C4, C5 and C6 in replication class 2 can be seen in Figure 4.

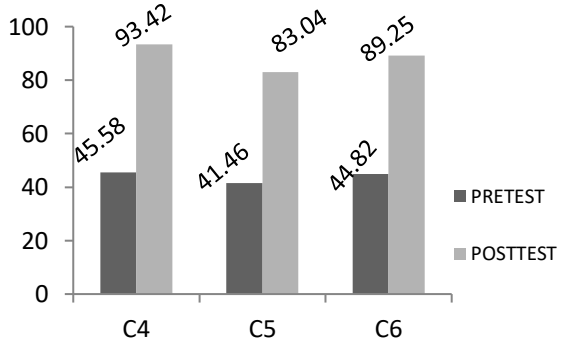

Figure 4. Average Learning Outcomes of Students in Replication Class 2

Replication class 2 shows the calculation results
On average, each achievement of cognitive levels C4, C5 and C6 has increased from pretest to posttest. At cognitive level C4, there was an increase of 47.84. Cognitive level C5 experienced an increase of 41.58, and cognitive level domain C6 by 44.43. So in replication class 2, the greatest increase occurred at cognitive level C4 compared to cognitive levels C5 and C6.

N-Gain Test

The N-gain test aims to see improvements in student learning outcomes through pretest and posttest, using the course average normalized gain. The average n-gain score of students' learning outcomes can be shown in Table 2.

Table 2. N-gain Test Results

Class	N-gain	Criteria
Experiment	0.74	Tall
Replication 1	0.66	Currently
Replication 2	0.73	Tall

Based on Table 2, it can be seen that the n-gain category in the experimental class and replication class 2 falls into the high criteria, and the replication class falls into the medium criteria. The n-gain analysis per indicator was also conducted with the aim of knowing the increase in students' conceptual understanding of each question indicator in the circulatory system material. The results of the n-gain analysis can be seen in Figure 5.

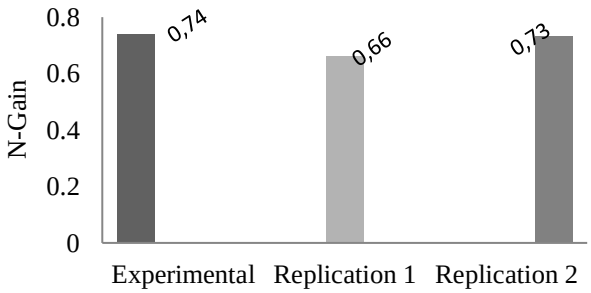

Figure 5. Average N-Gain Per Indicator

The average calculation result of the N-gain test for the experimental class is 0.74. In replication class 1, it is 0.66, and in replication 2, it is 0.72. So, the n-gain test in the experimental class and replication 2 is on the same criteria, namely high, while in replication class 1 it is on the medium criteria.

This study uses the Kolmogorov-Smirnov normality test formula with the help of Microsoft Excel. The results obtained from the statistical test can be seen in Table 3 of the following data normality test.

Table 3. Results of Data Normality Testing

Class	Fi	K	Status
Experiment	0.479	0.246	Normally Distributed
Replication 1	0.473	0.281	Normally Distributed
Replication 2	0.468	0.301	Normally Distributed

Based on Table 3, the results of the data normality test show that Fi ≥K for the real level α= 0.05. So, it can be concluded that the research data for the experimental class, replication 1, and replication 2 are normally distributed.

Hypothesis Testing

Hypothesis testing aims to determine whether there is an effect of the use of learning media assisted by Smart Apps Creator (SAC) on the material of the human circulatory system in the experimental class and replication class, given to students' cognitive learning outcomes. Hypothesis testing in both the experimental class, replication 1 and replication 2 can be seen in Table 4.

Table 4. Hypothesis Testing Results

Class	t_{count}	t_{table}	Criteria
Experiment	10.969	2.045	Ha Accepted
Replication 1	6.710	2.074	Ha Accepted
Replication 2	9.569	2.093	Ha Accepted

Based on Table 4.4, the results of the hypothesis test calculation show that in the experimental class, the t_{count} is 10.969, for replication class 1 it is 6.710, and for replication class 2 it $_{is}$ 9.569, with a t_{table} in the experimental class of 2.045, for replication class 1 it is 2.074 and for replication class 2 it $_{is}$ 2.093. So, it can be concluded based on the results of the hypothesis test in the experimental class, replication 1 and replication 2, namely the t_{count} is greater than the t_{table}, for the level of α = 0.05, then Ha is accepted or H0 $_{is}$ rejected. This can be seen in the post-test results of the three classes, where there is an increase in the average value of student learning outcomes from the pre-test value. The results obtained indicate that the average value of student learning outcomes is greater than or equal to the value of the learning objective achievement criteria (KKTP) of 75. In conclusion, the use of learning media assisted by Smart Apps Creator (SAC) influences students' cognitive learning outcomes. This is in accordance with the opinion of [14] that learning using Smart Apps Creator (SAC) media has an effect on students' cognitive abilities because they are more independent in understanding, accepting and mastering the material as taught. Learning using smart apps creator media, students work in groups and conduct discussions so that they can increase student interaction and involvement directly [15], so that students are more active in understanding learning materials and can easily remember and develop intelligent thinking skills by understanding a problem and analyzing how to solve the problem [16] .

Observation Of Learning Implementation and Student Activity

Based on the data from the calculation of student learning outcomes above, there is an increase in student learning outcomes after being given treatment using learning media assisted by Smart Apps Creator (SAC). This is also supported by the implementation of learning carried out by observers or science subject teachers for class VIII. The following are the results of observations of the implementation of learning using learning media assisted by Smart Apps Creator (SAC) in each class, both experimental classes, replication 1 and replication 2 can be seen in the form of a graph in Figure 6.

Based on Figure 6, the results of the percentage of observations of the implementation of learning media using Smart Apps Creator (SAC) show that the implementation of learning in meeting 2 is higher or better than in meeting 1 and meeting 3. This can be seen from the large percentage in meeting 2 compared to meeting 1 and meeting 3. The percentage results show that the implementation of learning using learning media assisted by Smart Apps Creator (SAC) has a good category in the learning process. There are stages that are not implemented in the Discovery Learning model, namely the preliminary stage, including a lack of preparation in the learning process. According to [17] teachers must have learning planning preparations that are in accordance with student characteristics so that they can build motivation to learn. In line with research [18] In the context of modern education, it is important for teachers to understand the role and learning interests of students so that teachers can create a learning environment that supports and motivates students to achieve their maximum learning potential. In addition to being seen from the implementation of learning, students' cognitive learning outcomes are also supported by student activity carried out by observers in the learning process using Smart Apps Creator media. The following are the results of observing student activity in the experimental and replication classes using learning media assisted by Smart Apps Creator (SAC), which can be seen in Figure 7.

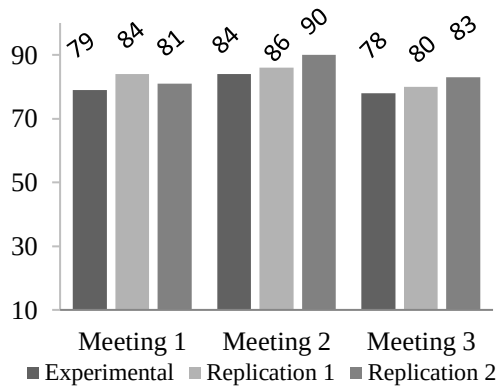

Figure 6. Percentage of Learning Implementation

Based on Figure 7, the results of the percentage of observations of the implementation of learning media using Smart Apps Creator (SAC) show that students are more active in proof activities compared to other activities. This can be seen from the large percentage. The percentage results show that student activity in using learning media assisted by Smart Apps Creator (SAC) is a very active category in the learning process. The results of the calculation of student activity in the experimental class, replication 1 and replication 2, using Smart Apps Creator (SAC) learning media, in this case, in presentation activities, are higher compared to other activities such as listening, reading, working on LKPD,

group discussions, asking questions and concluding. This is because students can increase their self-confidence and feel proud of what they have achieved and dare to share their results with others [19]. Teachers as instructors are expected to be able to plan and present Discovery Learning-based material that can increase students' interest and self-confidence in the learning process so that students are more active in learning [20].

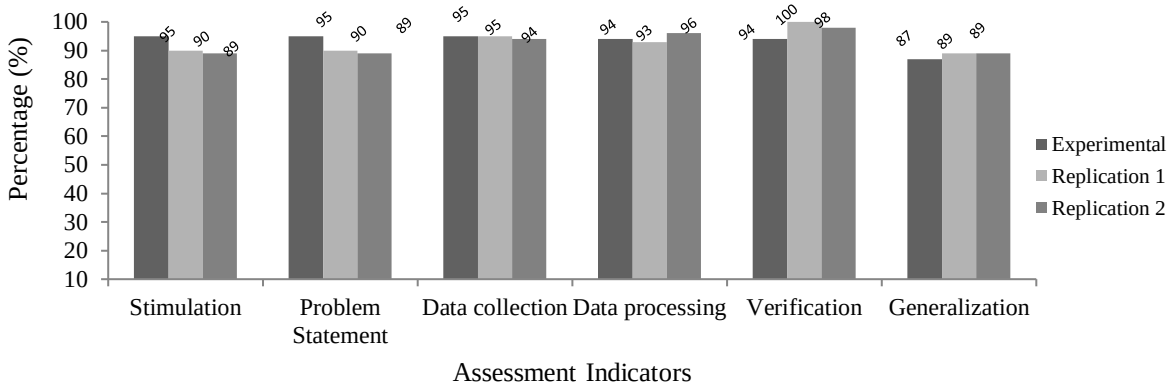

Figure 7. Percentage of student activity

Conclusion

Based on the results of the research that has been conducted using the experimental research method using the experimental class, replication 1 and replication 2 showed that using learning media assisted by Smart Apps Creator (SAC) on the material of the human circulatory system can affect students' cognitive learning outcomes. This is shown through the results of the hypothesis test where for the experimental class the $t_{count\ of}$ 10.969 is greater than the $t_{table\ of}$ 2.045, for replication class 1 the $t_{count\ of}$ 6.710 is greater than the $t_{table\ of}$ 2.074 and for replication class 2 the $t_{count\ of}$ 9.569 is greater than the $t_{table\ of}$ 2.093. Based on the explanation above, it can be concluded that from the hypothesis testing in each class, the $t_{count\ is}$ greater than the t table. This can be interpreted as the use of learning media assisted by Smart Apps Creator (SAC) influences students' cognitive learning outcomes. Thus, it is hoped that the use of this learning media can attract and increase students' interest and quality of learning, and students will be more enthusiastic about learning.

Author Contributions

Apriyansah Djano: Conceptualization, methodology, writing–original draft; Masra Latjompoh: Methodology, formal analysis, writing review and editing; Ritin Uloli: Writing–review and editing, Validation; Tirtawaty Abdjul: Formal analysis, Validation; Nova Elysia Ntobuo: Validation; Citron S. Payu: Validation.

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References

[1] A. R. Azizah, "Penggunaan Smart Apps Creator (SAC) untuk mengajarkan global warming," *Pros. Semin. Nas. Fis. Unesa*, vol. 4, no. 2, pp. 72–80, 2020.

[2] S. Ferlianti, A. R. Nurbani, D. Rusdiana, and I. Rahma, "Jurnal Pendidikan Indonesia (Japendi) Pendidikan Pengembangan Multimedia Pembelajaran Interaktif SAC (Smart Apps Creator) PADA MATERI TEKANAN HIDROSTATIS * Coorespondence INFO ARTIKEL Diajukan 29 Desember 2021 Diterima 18 Januari 2022 Diterbitkan 21 J," vol. 3, no. 1, pp. 2146–2157, 2022. https://doi.org/10.36418/japendi.v3i1.479

[3] D. Wardhani and S. Lathifah, "Pengembangan mobile learning berbasis Smart Apps Creator sebagai media pembelajaran fisika (Development of Smart Apps Creator-based mobile learning as a physics learning medium)," *Phys. Sci. Educ. J.*, vol. 1, pp. 90–95, 2021. https://doi.org/10.30631/psej.v1i2.746

[4] M. Fauziah, "Pengembangan Multimedia Interaktif Berbasis Aplikasi Smart Apps Creator Untuk Kelas Viii Smp," *J. Pendidik. Dompet Dhuafa*, vol. 12, no. 2, pp. 1–8, 2022. https://doi.org/10.24036/pmat.v11i2.13278

[5] Z. FAJRI, "Model Pembelajaran Discovery Learning Dalam Meningkatkan Prestasi Belajar Siswa Sd," *J. IKA PGSD (Ikatan Alumni PGSD) UNARS*, vol. 7, no. 2, p. 1, 2019. https://doi.org/10.36841/pgsdunars.v7i2.478

[6] P. G. O. Artawan, N. Kusmariyatni, and D. N. Sudana, "Pengaruh Model Pembelajaran Discovery Learning Terhadap Hasil Belajar IPA," *J. Ilm. Pendidik. Profesi Guru*, vol. 3, no. 3, p. 452, 2020. https://doi.org/10.23887/jippg.v3i3.29456

[7] N. A. Novitasari and A. M. Laili, "Pengaruh Model Discovery Learning Berbantuan Media Powerpoint Terhadap Kemampuan Berpikir Kritis Ipa Siswa Kelas Viii," *LENSA (Lentera Sains) J. Pendidik. IPA*, vol. 13, no. 1, pp. 30–38, 2023. https://doi.org/10.24929/lensa.v13i1.257

[8] S. Khasinah, "Discovery Learning: Definisi, Sintaksis, Keunggulan dan Kelemahan," *J. MUDARRISUNA Media Kaji. Pendidik. Agama Islam*, vol. 11, no. 3, p. 402, 2021. https://doi.org/10.22373/jm.v11i3.5821

[9] Y. A. Yunus and N. Yusaerah, "Pengaruh Model Pembelajaran Discovery Learning Pada Mata Pelajaran Ipa Terhadap Hasil Belajar Peserta Didik Kelas Viii Smpn Patampanua," *J. Pendidik. IPA EDUKIMBIOSAS*, no. 2, 2023.

[10] E. B. Shahbana, F. Kautsar farizqi, and R. Satria, "Implementasi Teori Belajar Behavioristik Dalam Pembelajaran," *J. Serunai Adm. Pendidik.*, vol. 9, no. 1, pp. 24–33, 2020. https://doi.org/10.37755/jsap.v9i1.249

[11] I. N. Sukadana, "Model Pembelajaran Kooperatif Tipe Think Pair Share (TPS) Untuk Meningkatkan Hasil Belajar IPA Siswa SMP," *J. Penelit. dan Pengemb. Pendidik.*, vol. 6, no. 1, pp. 50–55, 2022. https://doi.org/10.23887/jppp.v6i1.44596

[12] Dede Kusnandar, "p-ISSN: 2685-0397 e-ISSN: 2685-6387," *Madrascience*, vol. 1, pp. 17–30, 2019.

[13] D. D. Fatmawati and N. Shofiyah, "Penerapan Lembar Kerja Peserta Didik Berbasis Science Technology Engineering Mathematics Dengan Model Problem Based Learning Sebagai Alternatif Solusi Untuk Melatih Kemampuan Literasi Sains Siswa," *EDUPROXIMA J. Ilm. Pendidik. IPA*, vol. 4, no. 2, pp. 89–99, 2022. https://doi.org/10.29100/eduproxima.v4i2.2142

[14] L. L. Sholihah and S. N. Hidayati, "Penerapan Media Smart Apps Creator Dalam Pembelajaran Berbasis Inkuiri Untuk Meningkatkan Hasil Belajar Siswa," *EDUPROXIMA J. Ilm. Pendidik. IPA*, vol. 5, no. 2, pp. 116–122, 2023. https://doi.org/10.29100/.v5i2.4204

[15] E. D. Sirait and D. D. Apriyani, "Pemanfaatan Media Pembelajaran Menggunakan Smart Apps Creator (Sac)," *Semnas Ristek (Seminar Nas. Ris. dan Inov. Teknol.*, vol. 8, no. 01, pp. 90–95, 2024. https://doi.org/10.30998/semnasristek.v8i01.7139

[16] H. Khotimah, M. Nawir, and S. Ayu, "Pengaruh Mobile Learning Berbasis Smart Apps Creator (SAC) Terhadap Minat Belajar IPA Terpadu Siswa di SMPN 2 Bontomarannu Kabupaten Gowa," *Jejak Pembelajaran J. Pengemb. Pendidik. Vol.*, vol. 7, no. 3, pp. 64–75, 2023.

[17] Y. Sizi, Y. Bare, and R. Galis, "Pengaruh Model Pembelajaran Kooperatif Tipe Talking Stick Terhadap Keaktifan dan Hasil Belajar Kognitif Peserta Didik SMP Kelas VIII," *Spizaetus J. Biol. dan Pendidik. Biol.*, vol. 2, no. 1, p. 39, 2021. https://doi.org/10.55241/spibio.v2i1.30

[18] Sarbaitinil, Muzakkir, Muhammad Yasin, Irfan Sepria Baresi, and Muhammadong, "Menumbuhkan Minat Belajar Siswa melalui Metode Pembelajaran Kreatif," *J. Int. Multidiscip. Res.*, vol. 2, no. 2, pp. 367–379, 2024. https://doi.org/10.62504/JIMR75xf4w76

[19] M. Meri, H. T. Maria, and V. Karolina, "Korelasi Antara Tingkat Keaktifan Peserta didik dengan Hasil Belajar Melalui Model Pembelajaran Discovery Learning," *J. Dimens. Pendidik. dan Pembelajaran*, vol. 11, no. 1, pp. 206–211, 2023. https://doi.org/10.24269/dpp.v11i1.8448

[20] A. Pratama, D. Fazera, L. A. Fortunata, N. Manurung, and R. Fadilah, "Penerapan Model Pembelajaran Discovery Learning untuk Meningkatkan Hasil Belajar Siswa," *J. Inov. Pendidik.*, vol. 2, no. 1, pp. 21–31, 2024. https://doi.org/10.60132/jip.v2i1.190