MJP Journal of Education and Teaching Learning
Vol. 4, No. 1 (2026): 1624 – 1630
https://jurnalilmiah.co.id/index.php/MJPJETL

IMPROVING IPAS LEARNING OUTCOMES ON THE SOLAR SYSTEM TOPIC THROUGH THE IMPLEMENTATION OF THE DISCOVERY LEARNING MODEL ASSISTED BY AUDIO-VISUAL MEDIA FOR FIFTH-GRADE STUDENTS AT SDN 7 DUNGALIYO, GORONTALO REGENCY

[1] Dewi Rahmawati jafar, [2] Gamar Abdullah, [3] Meylan saleh, [4] Vicka muniati arifin, [5] Nurfadliah.

[1] [2] [3] [4] [5] Pendidikan Guru Sekolah Dasar, Universitas Negeri Gorontalo, Indonesia,
Email: jafardewi075@gmail.com

Correspondence Author: jafardewi075@gmail.com

Article Info

Keywords:

Learning Outcomes, Audio-Visual Media, Discovery Learning.

ABSTRACT

Dewi Rahmawati Jafar 2026. *Implementing the Discovery Learning Model Assisted by Audio-Visual Media to Improve IPAS Learning Outcomes on the Solar System Topic for Fifth-Grade Students at SDN 7 Dungaliyo.* Department of Primary School Teacher Education, Faculty of Education, Universitas Negeri Gorontalo. Advisor I: Dr. Gamar Abdullah, S.Si., M.Pd. Advisor II: Dr. Meylan Saleh, S.Pd., M.Pd.The problem addressed in this study is whether the implementation of the Discovery Learning model assisted by audio-visual media can improve Natural and Social Sciences (IPAS) learning outcomes on the solar system topic for fifth-grade students at SDN 7 Dungaliyo. This study aims to improve the IPAS learning outcomes on the solar system topic for fifth-grade students at SDN 7 Dungaliyo through the implementation of the Discovery Learning model assisted by audio-visual media. This type of research is Classroom Action Research (CAR). Data collection techniques in this study included observation, interviews, tests, and documentation. During the initial observation, the students' achieved abilities were still very low, with only 4 students (22%) attaining high IPAS learning outcomes or scoring above the Learning Objective Achievement Criteria (KKTP). In the implementation of Cycle I, an increase was observed, reaching 8 students (44.4%). However, this result had not yet met the established classical mastery criteria of 70%, necessitating the continuation of the research into the next cycle, Cycle II. In Cycle II, there was an increase in student learning mastery, reaching 16 students (88.9%). The results of the study indicate that the implementation of the Discovery Learning model assisted by audio-visual media significantly improves IPAS learning outcomes on the solar system topic for fifth-grade students at SDN 7 Dungaliyo.

Informasi Artikel

Kata Kunci:

Hasil Belajar, Media Audio Visual, Discovery Learning

ABSTRAK

Dewi Rahmawati Jafar 2026, Penerapan Model *discovery learning* berbantuan media audio visual Untuk Meningkatkan Hasil Belajar IPAS Materi Tata Surya Pada Murid Kelas V SDN 7 Dungaliyo. Jurusan Pendidikan Guru Sekolah Dasar, Fakultas Ilmu Pendidikan, Universitas Negeri Gorontalo. Pembimbing I Dr. Gamar Abdullah, S.Si., M.Pd, Pembimbing II Dr. Meylan Saleh, S.Pd., M.Pd. Masalah pada penelitian ini, Apakah dengan penerapan model *discovery learning* berbantuan media audio visual dapat meningkatkan hasil belajar IPAS materi tata surya pada murid kelas V SDN 7 Dungaliyo?. Tujuan pada penelitian ini untuk Meningkatkan Hasil Belajar IPAS materi tata surya murid Kelas V SDN 7 Dungaliyo Melalui Penerapan Model *discovery learning* Berbantuan Media audio visual. Jenis penelitian ini adalah penelitian tindakan kelas (PTK). Teknik pengumpulan data dalam penelitian ini diantaranya observasi, wawancara, tes dan dokumentasi.Pada saat observasi awal kemampuan yang diperoleh murid masih sangat rendah yakni hanya 4 murid atau 22% yang hasil belajar IPAS tinggi atau diatas KKTP. Pada pelaksanaan penelitian Siklus I terjadi peningkatan yakni berjumlah 8 orang murid atau 44,4%. Hal ini belum mencapai kriteria ketuntasan klasikal yang telah ditetapkan yakni 70%, sehingga penelitian akan dilanjutkan pada siklus selanjutnya yakni Siklus II. Pada Siklus II terjadi peningkatan ketuntasan belajar murid berjumlah 16 orang murid atau 88,9%. Hasil penelitian menunjukkan bahwa penerapan model *discovery learning* berbantuan media audio visual secara signifikan meningkatkan hasil belajar IPAS materi tata surya pada murid kelas V SDN 7 Dungaliyo.

Article History

Received : 12/06/2026
Revised : 28/06/2026
Accepted : 21/07/2026

✉ *Corresponding Author:* (1) Dewi Rahmawati jafar, (2) Elementery schole Education Study Program (3) Universitas Negeri Gorontalo, Indonesia, (4) Email: jafardewi075@gmail.com

1. Introduction

Education is a conscious, deliberate, and fully responsible activity carried out by adults toward children, creating an interaction between both parties to help the children achieve their envisioned maturity through a continuous process. The government hopes that through education, the community or students can prepare themselves to become individuals with noble character, knowledge, and skills, who are capable of fulfilling their duties and responsibilities both personally and within society. In the educational process, behavioral changes always occur; this involves not only shifting from a state of ignorance to knowledge but, more importantly, encompassing all aspects of education, namely cognitive, affective, and psychomotor. Education serves as a crucial beginning for a child, as it trains them to read proficiently while sharpening their numeracy and thinking skills.

Primary school education forms the main foundation for developing students' character, knowledge, and basic skills. This process focuses not only on mastering cognitive aspects but also includes the development of affective and psychomotor domains that support holistic child growth. According to Susiani (2022), the quality of learning in primary schools significantly influences the overall quality of education, as this stage lays the groundwork for developing logical, critical, and creative thinking skills.

One of the Natural and Social Sciences (IPAS) topics for fifth-grade primary school students is the solar system. This topic covers the sun as the center of the solar system, the planets and their characteristics, the rotation and revolution of the Earth, and various other celestial bodies. This material is categorized as abstract because the objects studied cannot be observed directly by the students. This condition often causes students to experience difficulties in understanding concepts if the lesson is delivered solely through the lecture method without the support of appropriate learning media.

Initial observations at SDN 7 Dungaliyo indicated that student learning outcomes regarding the solar system topic remained low. The majority of students had not reached the Learning Objective Achievement Criteria (KKTP) set by the school. These low learning outcomes were influenced by several factors, including a learning process still dominated by the lecture method, minimal use of learning media, and the lack of implementing learning models that encourage active student engagement. Consequently, students tended to be passive, lacked motivation in participating in the lesson, and faced difficulties understanding abstract concepts.

One learning model considered appropriate to address these issues is Discovery Learning. This model places students at the center of learning through the process of independently discovering concepts through stages of stimulation, problem identification, data collection, data processing, verification, and generalization. The teacher acts as a facilitator who guides students throughout the discovery process so that learning becomes more meaningful.

To ensure a more effective implementation of Discovery Learning, support from learning media capable of visualizing abstract concepts is required. One suitable medium is audio-visual media. This medium is capable of presenting information through a combination of images, animations, videos, and sound, allowing difficult-to-understand concepts to be displayed more realistically. In the solar system topic, audio-visual media enables students to observe planetary movements, Earth's rotation, Earth's revolution, and other natural phenomena that are impossible to observe directly in the classroom.

Various previous studies have shown that both the Discovery Learning model and audio-visual media, when applied separately, are capable of improving student learning outcomes. However, research that integrates these two components into IPAS learning for the solar system topic in primary schools remains relatively limited. Therefore, this study offers novelty by combining the Discovery Learning model assisted by audio-visual media as an effort to improve the learning outcomes of fifth-grade students at SDN 7 Dungaliyo.

Based on the aforementioned context, the purpose of this study is to analyze the effectiveness of implementing the Discovery Learning model assisted by audio-visual media in improving IPAS learning outcomes for the solar system topic. The results of this study are expected to serve as an alternative for primary school teachers in developing more innovative and interactive learning that can enhance the quality of student learning outcomes.

2. Method

This study employed the Classroom Action Research (CAR) method, referencing the Kemmis and McTaggart model, which consists of four stages: planning, action, observation, and reflection. The research was conducted in two cycles, with each cycle serving as the basis for learning improvements in the subsequent cycle until the success indicators were achieved.

The research was carried out at SDN 7 Dungaliyo, Gorontalo Regency, during the even semester of the 2025/2026 academic year. The research subjects were all 18 fifth-grade students, consisting of 4 male students and 14 female students. The object of the research was the improvement of Natural and

Social Sciences (IPAS) learning outcomes on the solar system topic through the implementation of the Discovery Learning model assisted by audio-visual media.

The action stages began with designing learning tools, including teaching modules, student worksheets, audio-visual media, observation instruments for teacher and student activities, and learning outcome tests. During the implementation stage, the teacher applied the Discovery Learning syntax, which includes stimulation, problem identification, data collection, data processing, verification, and generalization. Audio-visual media was utilized to assist students in understanding abstract concepts regarding the solar system, making the learning process more concrete and engaging.

Research data were collected through several techniques: observation, tests, documentation, and interviews. Observation was conducted to determine the implementation of learning as well as teacher and student activities during the learning process. Tests were used to measure the achievement of student learning outcomes at the end of each cycle. Documentation was performed by gathering photos of learning activities, learning tools, and students' work. Interviews were used as supporting data to obtain information regarding the constraints faced by both the teacher and students during the learning process.

The research instruments consisted of teacher activity observation sheets, student activity observation sheets, learning outcome test questions, interview guides, and documentation. These instruments were used to obtain comprehensive data regarding both the process and the results of the action implementation.

Data analysis was conducted using both descriptive quantitative and descriptive qualitative methods. Quantitative data were analyzed by calculating the class average score and the percentage of learning mastery using the following formula:

{Learning Mastery (%)} = {Number of Students Achieving Mastery}{Total Number of Students}= 100\%

Meanwhile, qualitative data were analyzed through the stages of data reduction, data display, and conclusion drawing based on the results of observations, interviews, and documentation during the study.

The research success indicator was established when at least 85% of the students achieved a score that met or exceeded the Learning Objective Achievement Criteria (KKTP) threshold of 70. Furthermore, the success of the action was also demonstrated by increased student learning activities, the successful implementation of the Discovery Learning syntax, and enhanced student participation during the learning process.

3. Resultand Discission

This classroom action research was conducted in two cycles to improve Natural and Social Sciences (IPAS) learning outcomes on the solar system topic through the implementation of the Discovery Learning model assisted by audio-visual media for fifth-grade students at SDN 7 Dungaliyo. Each cycle consisted of planning, action, observation, and reflection stages. The data obtained included student learning outcomes, teacher activities, and student activities during the learning process.

Based on initial observations, IPAS learning was still dominated by the lecture method. The teacher mostly explained the material verbally, while the students merely listened and took notes. The use of learning media remained highly limited, making the abstract concepts within the solar system topic difficult for students to comprehend.

The results of the initial evaluation indicated that the majority of students had not yet achieved the Learning Objective Achievement Criteria (KKTP). Out of 18 students, only approximately 22% achieved learning mastery, while the remaining 78% had not yet mastered the material. These low learning outcomes demonstrated that the learning process had not optimally accommodated the students' learning needs.

This condition was influenced by several factors, namely low student participation during lessons, the lack of student-centered learning models, and the underutilization of audio-visual media that could help explain solar system concepts more concretely

Implementation of Cycle I Actions

In Cycle I, the teacher began implementing the Discovery Learning model assisted by audio-visual media. The learning activity commenced with the provision of stimulation in the form of a video about the solar system to arouse students' curiosity. Subsequently, students were guided to identify problems, collect information through group discussions, process the information, verify the discussion results, and draw conclusions together.

During the learning process, an increase in student activity was observed compared to the initial condition. Students began to have the courage to ask questions, express opinions, and cooperate within their groups. The audio-visual media helped students understand the positions of the planets, Earth's rotation, Earth's revolution, and other natural phenomena that were previously difficult to envision.

Nevertheless, the implementation of Cycle I still faced several obstacles. Some students were still hesitant to express their opinions, a few groups had not cooperated to their full potential, and the teacher still needed to improve time management across each stage of Discovery Learning.

The test results at the end of Cycle I showed an improvement in learning outcomes. The percentage of learning mastery increased to 44.4%. Although an increase occurred compared to the initial condition, these results had not yet reached the research success indicator, necessitating the continuation of **the action into Cycle II.**

Reflection of Cycle I

The results of the reflection indicated that the implementation of Discovery Learning had exerted a positive impact on student learning activities. However, several aspects still required improvement, including providing more intensive guidance to groups experiencing difficulties, enhancing the quality of group discussions, and optimizing the use of audio-visual media to ensure all students could comprehend the material more easily.

The teacher also needed to motivate students who remained passive so that all learners would have equal opportunities to participate in the learning process.

Implementation of Cycle II Actions

Learning improvements in Cycle II were carried out based on the results of the Cycle I reflection. The teacher provided clearer instructions at each learning stage, enhanced interaction with students, increased discussion opportunities, and optimized the use of audio-visual media through more interactive learning videos.

The learning atmosphere in Cycle II became more active. Students demonstrated higher enthusiasm in observing videos, discussing, collecting information, and presenting their findings in front of the class. This increased learning activity subsequently led to an enhancement in students' understanding of solar system concepts.

Based on the evaluation results at the end of Cycle II, the number of students achieving learning mastery increased significantly to 88.9%. This percentage surpassed the established research success indicator, which required a minimum of 85% of students to achieve the KKTP threshold.

The improvement in learning outcomes from the pre-action phase, Cycle I, through Cycle II indicates that the implementation of the Discovery Learning model assisted by audio-visual media exerts a positive influence on both the process and outcomes of IPAS learning.

The research findings indicate that the Discovery Learning model is capable of improving learning outcomes because it provides opportunities for students to construct knowledge through direct learning experiences. Students do not merely receive information from the teacher, but actively observe, identify problems, collect data, analyze information, and independently conclude the learning outcomes.

Audio-visual media also contributes significantly to helping students understand the abstract nature of the solar system topic. Animations concerning planetary movements, Earth's rotation, Earth's revolution, and solar system phenomena make it easier for students to connect concepts with real-world conditions. Consequently, learning becomes more engaging, which in turn increases learning motivation.

The improvement in learning outcomes obtained aligns with Jerome Bruner's theory, which states that learning will be more meaningful if learners discover the concepts being studied through a discovery process. This view is supported by Arsyad, who explains that audio-visual media can enhance students' attention, motivation, and comprehension of learning materials.

The findings of this study also support previous research stating that the implementation of the Discovery Learning model is effective in improving students' learning outcomes and critical thinking skills. The distinction is that this study integrates the use of audio-visual media, thereby making the learning of the solar system topic more concrete and easily understood by primary school students.

In addition to improving learning outcomes, the implementation of the Discovery Learning model assisted by audio-visual media also enhances learning activities, cooperation skills, the courage to express opinions, and students' critical thinking skills during the learning process. This condition indicates that learning success is measured not only by final scores but also by the quality of the learning process taking place within the classroom.

Overall, the research results prove that the implementation of the Discovery Learning model assisted by audio-visual media is an effective learning strategy to improve IPAS learning outcomes on the solar system topic for fifth-grade students at SDN 7 Dungaliyo. This model can serve as an alternative for primary school teachers in creating active, innovative, and student-centered learning.

4. Conclusion

Based on the research findings, it can be concluded that the implementation of the Discovery Learning model supported by audio-visual media in the Natural and Social Sciences (IPAS) subject on the solar system topic successfully improves the learning outcomes of fifth-grade students at SDN 7 Dungaliyo.

This improvement is demonstrated by a significant increase in learning achievement between Cycle I and Cycle II. In Cycle I, the number of students who met the Learning Objective Achievement Criteria ($\text{KKTP} \ge 80$) was 8 students, with a percentage of 44.4%. Following learning improvements in Cycle II based on the reflection from Cycle I, the number of students achieving the KKTP increased to 16 students, reaching a percentage of 88.9%. This increase indicates that the classical mastery indicator of at least 85% has been successfully achieved.

This success was influenced by the improvement and optimization of the Discovery Learning model syntax implementation in Cycle II, which was executed in a more structured and equitable manner. This was particularly evident in the somatic aspect through the direct involvement of all students, enhanced intellectual activity in group discussions, and the use of more interactive and participative audio-visual media. These improvements made the learning process more active, meaningful, and aligned with the characteristics of IPAS materials that require concrete experiences. Thus, the research hypothesis stating that the implementation of the Discovery Learning model assisted by audio-visual media can improve the learning outcomes of fifth-grade students at SDN 7 Dungaliyo is accepted.

References

[1]. Arsyad, A. (2013). Media Pembelajaran. Jakarta: Rajawali Pers.

[2]. Arsyad, A. (2017). Media Pembelajaran. Jakarta: Rajawali Pers. Konsep, fungsi, dan jenis media audio visual dalam pembelajaran.

[3]. Ardika, M. K., Paramitha, A. A., Nurwahidin, M., & Yulianti, D. (2022). Studi Literatur: Hasil Belajar Ditinjau dari Faktor Eksternal Peserta Didik. *Jurnal Pengembangan Profesi Pendidik Indonesia*, 2(2)

[4]. Aurel, N. S., & Syefrinando, B. (2025). The Development of Science Learning Media Based on *Discovery learning* Assisted by Canva..

[5]. Brown, C., Jones, L., & Williams, S. (2020). Enhancing critical thinking skills through *Discovery learning* in science education.

[6]. Buku kurikulum kelas V yang membahas materi tata surya secara lengkap dan kontekstual untuk SD.

[7]. Dian, Auliarahma. 2023. "Pengaruh Model *Discovery learning* Terhadap Hasil Belajar IPAS Kelas Iv Sdn 1 Bumi Nabung Timur Lampung Tengah".

[8]. Grobogan, Kabupaten. 2022. "PENERAPAN MODEL BASED KREATIVITAS MURID KELAS XI TATA BUSANA 2 SMK NEGERI 1 PURWODADI SEMESTER GANJIL TAHUN PELAJARAN 2019 / 2020" 3 (2): 176–88.

[9]. Hidayat, T., & Kurniawan, D. (2020). *Discovery learning* model in improving science achievement of elementary students. Jurnal Pendidikan dan Pembelajaran, 27(4), 350–362.

[10]. Isnaeni, N., Susiani, T. S., & Chamdani, M.

(2022). Hubungan antara kemandirian belajar dan lingkungan belajar di sekolah terhadap hasil belajar IPAS murid kelas V SDN Sekecamatan Klirong tahun ajaran 2021/2022. CaXra: Jurnal Pendidikan Sekolah Dasar, 2(2), 88-97.

[11]. Istiqomah, I., & Adi, B. S. (2024). The Effect of Using Powtoon Animation Learning Media on Solar System Material on the Learning Outcomes of Class VI Elementary School Students. Jurnal Penelitian Pendidikan IPAS, 10(3), 1450-1457.

[12]. Juliani, rizki. 2025. "PENERAPAN *DISCOVERY LEARNING* DALAM PEMBELAJARAN IPAS UNTUK MENINGKATKAN" 8 (1): 9–15.

[13]. Kadek, Ni, Krisma Devi, Yunika Manik, og I Gde Wawan Sudatha. 2021. "Instrumen Tes Hasil Belajar pada Muatan Pelajaran IPAS untuk Kelas IV Sekolah Dasar" 2:22–28.

[14]. Kristin, Firosalia. 2020. "META ANALISIS PENGGUNAAN MODEL PEMBELAJARAN *DISCOVERY LEARNING* DALAM MENINGKATKAN HASIL BELAJAR IPAS MURID SD" 4:529–36.

[15]. Kustiani, Lilik, og Lilik Sri Hariani. 2018. "Faktor-Faktor Yang Mempengaruhi Hasil Belajar Murid" 12 (1): 14–22.

[16]. Lin, Herlina. 2024. "Ilmu Pengetahuan Alam (IPAS) di Sekolah Dasar P embelajaran", 10–38.

[17]. Menguraikan definisi, jenis, fungsi, dan penggunaan media pembelajaran termasuk media audio visual.

[18]. Pratiwi, D. (2017). Ilmu Pengetahuan Alam untuk SD/MI Kelas V. Jakarta: Pusat Kurikulum dan Perbukuan, Balitbang Kemendikbud.

[19]. Putra, Rizky Pratama, og Ulum Surakarta. 2024. "Objek evaluasi hasil belajar pendidikan agama islam analisis taksonomi bloom (kognitif, afektif, psikomotorik)" 5 (1): 18–26.

[20]. Rahmawati, R., & Kasriman, K. (2022). Pengaruh model pembelajaran SAVI (Somatic, Auditory, Visual, Intellectual) terhadap hasil belajar muridsekolah dasar. Jurnal Basicedu, 6(3), 4570–4577.

[21]. Rahmawati, Y., & Widodo, A. (2021). Penerapan model pembelajaran inovatif dalam meningkatkan aktivitas dan hasil belajar murid sekolah dasar. Jurnal Pendidikan Dasar, 12(2), 145–153.

[22]. Rukajat, Ajat. 2018. *Penelitian Tindakan Kelas (Classroom Action Research) Disertai Contoh Judul Skripsi Dan Metodologinya.* Yogyakarta: Deepublish.

[23]. Rampisela, T., Korlefura, C., & Suhry, H. (2025). PERAN DUKUNGAN ORANG TUA DAN SELF-EFFICACY DALAM MENINGKATKAN MOTIVASI BELAJAR PESERTA DIDIK. NETIZEN: JOURNAL OF SOCIETY AND BUSSINESS, 1(12), 740-748

[24]. Saleh, M. (2015, May). Pengaruh Metode Demonstrasi Terhadap Hasil Belajar Murid Kelas V Pada Pembelajaran IPAS Materi Sifat-Sifat Cahaya di SDN 16 Bongomeme Kabupaten Gorontalo. In Prosiding Seminar Nasional Jurusan PGSD FIP UNP Tahun 2015 (Vol. 1, No. 1).

[25]. Saleh, M., Abdullah, G., Hasim, E., & Katili, S. (2023). Implementasi Model Pembelajaran Mordiscvein di Era Merdeka Belajar di Sekolah Dasar. Dikmas: Jurnal Pendidikan Masyarakat dan Pengabdian, 3(2), 339-346.

[26]. Slameto. (2019). *Belajar dan Faktor-Faktor*

yang Mempengaruhinya. Jakarta: Rineka Cipta.

[27]. Saleh, M. (2024). Pengaruh Model Pembelajaran Mordiscvein Terhadap Hasil Belajar Murid Pada Mata Pelajaran IPAS Di Sd

[28]. Sari, M., & Lestari, Y. (2019). The effectiveness of *Discovery learning* in elementary science education. International Journal of Elementary Education, 3(2), 95–104.

[29]. Sari, Mayang. 2025. "Desain Dan Prosedur Penelitian Tindakan Kelas (Classroom Action Research) Dalam Peningkatan Keterampilan Berbicara Bahasa Indonesia Melalui Metode Bercerita" 15 (2).

[30]. Sari, N. P., Wulandari, R., & Hidayat, T. (2023). Pemanfaatan media pembelajaran digital interaktif untuk meningkatkan motivasi belajar murid sekolah dasar. Jurnal Pendidikan Dasar, 7(2), 120–128.

[31]. Siddik, Ananda, Akbar Al Fadillah, Egianisa Br Sitepu, Farraz Aulia Ihsan, og Indah Sri Ratih. 2025. "Taxonomy of Educational Goals and Evaluation of Learning Outcomes" 5 (1): 10–13. https://doi.org/10.30596/jcositte.v1i1.xxx.

[32]. Syaras Fadillah, Erfan Ramadhani, Arief Kuswidyanarko. 2021. "Efektivitas Model Pembelajaran", 423–40.

[33]. Umar Sriyanti K, Irvin Novita Arifin, Gamar Abdullah, Abdul Haris Panai, og Meylan Saleh. 2025. "Meningkatkan Hasil Belajar Murid Melalui Penerapan Model *Discovery learning* Berbantuan Video Pembelajaran Materi Bunyi Dan Sifatnya Kelas V Sdn 89 SIPAStana" 10.

[34]. Wicaksono, A. G., Jumanto, J., & Irmade, O. (2020). Pengembangan media komik komsa materi rangka pada pembelajaran IPAS di sekolah dasar. Premiere Educandum, 10(2), 522537.

[35]. Yuniarti, Ratna. 2022. "Kesalahan Mahamurid Program Studi Administrasi Publik Dalam Menyelesaikan Soal Statistika Deskriptif Dan Statistika Inferensial". Jurnal Sains Matematika dan Statistika 8 (1): 46. https://doi.org/10.24014/jsms.v8i1.13312.

[36]. Zuhri, Muhammad Saifuddin. 2024. "Penerapan Model Problem Based Learning Berbantuan Papan Waktu untuk Meningkatkan Hasil Belajar Murid pada Materi Satuan Waktu" 4 (2): 253–64.