



PROBLEMATICS OF LEARNING SCIENCE IN GRADE V ELEMENTARY SCHOOL STUDENTS IN MALANG CITY

Esti Untari¹, Faiz Septia Fany², Maulidatul Azizah³, Muhammad Rofik Munawar⁴, Nova Anisha Rahmadini⁵, Regita Vio Adellia⁶

^{1,2,3,4,5,6}State University of Malang

²Department of Primary Education and Preschool, State University of Malang, Malang, Indonesia

*Corresponding author, email: esti.untari.fip@um.ac.id

Keywords

Problems
media
model

Abstract

Science learning in elementary schools experiences several fundamental problems. Based on exploration results, it was found that: 1) Learning media are varied but not well utilized by teachers. 2) The application of various learning models, such as cooperative models, project-based learning models, SAVI (Somatic, Auditory, Visual, Intellectual), and other learning models is not yet optimal. 3) The selection of varied learning methods, but teachers are still unable to practice them optimally. 4) Facilities such as science laboratories are not yet available. 5) Students' understanding of the concepts or materials explained is not deep, tending to cause misunderstandings. The purpose of this research is to increase motivation and make science learning more enjoyable.

1. Introduction

Education is very important in life. Through education, a nation can achieve progress in various fields of life. Quality education can produce a prosperous and modern society. Thus, the quality of education is one of the indicators of an advanced nation. Therefore, education must be handled well by both the government and educators (Sudarto et al., 2024).

In addition to the curriculum, educators, students, and the learning process play an important role in efforts to improve education, especially at the elementary school level. This states that a good learning process can improve the quality of education. Djamaluddin & Wardana (2019) say that the learning process is a stimulus that can challenge students to be involved and participate in learning activities. Active participation of students can be realized with innovative and varied learning models or designs, the use of interesting media, and supported by adequate learning facilities.

One of the subjects taught at all levels up to higher education is science. Learning science is important for students because it is relevant to everyday life. Students assume that this science material is difficult to learn, making students bored (Gumilar, 2023). Therefore, teachers are required to design science learning as attractively as possible so that students can be interested and not feel bored in the learning process. Attractive science learning can be achieved by designing learning using innovative models (Safira et al., 2020).

Science learning has a very important role at every level of education, from elementary to higher education. Through science learning, students can understand various natural phenomena, so that students are able to behave and act wisely (Widodo, 2021). Therefore, Science Education has been taught from an early age, namely at the elementary school level (Jannah & Atmojo, 2022).

The nature of science learning is not only focused on understanding scientific concepts, but also on developing science process skills, such as observing, classifying, measuring, concluding, and communicating results. This learning encourages students to think critically and creatively in dealing with problems related to nature and the environment around them. Science learning also emphasizes the importance of developing scientific attitudes which include curiosity, thoroughness, honesty, critical thinking, and openness. In the learning process, students are not only invited to understand scientific concepts, but are also trained to conduct investigations through scientific methods such as observing, formulating hypotheses, and drawing conclusions based on empirical data. This aims to enable students to develop scientific thinking and problem-solving skills that can be applied in

everyday life, including in facing global challenges and technological developments (Elisa et al., 2023).

The role of teachers in science learning is very important, not only in delivering material, but also as facilitators who encourage students' active involvement in the learning process. Teachers play a role in guiding students to make observations, experiments, and draw conclusions from natural phenomena, so that students can develop critical and scientific thinking skills. In addition, teachers must also be able to create a conducive classroom atmosphere by using innovative learning methods, such as inquiry learning models or project-based learning, which allow students to understand science concepts through direct experience (Fajar Septiana et al, 2019).

Challenges in science learning include various aspects that affect the success of the teaching-learning process. One of the main challenges is the low interest of students in science material, which is often caused by monotonous and less interactive learning methods. In addition, limitations of facilities and infrastructure such as adequate laboratories or learning media also become obstacles in providing real and relevant learning experiences. Teachers also face challenges in developing teaching strategies that can attract students' attention, as well as ensuring that each student can understand abstract scientific concepts. External factors such as lack of parental support in facilitating learning resources at home further complicate the learning process (Mawardini & Inayah, 2024).

Science learning plays a very important role in shaping students' scientific understanding and skills, as well as in encouraging them to be critical and creative towards natural phenomena. To achieve these goals, good collaboration between teachers, students, and parents is needed, as well as the application of innovative and interactive learning methods. Overcoming challenges in science learning is an important step to increase student interest and motivation, so they can learn more effectively and be ready to face challenges in an increasingly complex global era. With consistent and directed efforts, it is hoped that the quality of science learning can continue to be improved and have a positive impact on the development of education and character of students.

Problems in science learning related to the use of learning media must be resolved so that the objectives of science learning can be achieved effectively in developing students' abilities in cognitive, affective, and psychomotor aspects. Therefore, in the science learning process, especially to support high-level critical thinking in Gen Z students, an ideal strategy is needed (Ramadhani et al., 2021). In science learning, digital media is one option that can be used by teachers to provide meaningful and fun understanding for students (Batubara, 2021).

Varied learning media for elementary school students are expected to attract students' attention. So that in use it is necessary to pay attention to the following criteria, namely: (1) in accordance with the objectives; (2) precisely support material that is factual, conceptual, principled, and generalized; (3) practical, flexible, and durable; (4) capable and skilled in using; (5) target grouping; and (6) technical quality (Winangun, 2022). This media greatly helps students in learning science in clarifying abstract material.

Teachers in using innovative learning models need to pay attention to learning objectives, student characteristics and learning outcomes to be achieved. This aims to increase motivation and make learning more fun (Asyafah, 2019). In addition, the application of innovative learning models can make students actively participate and learning is student-centered. In addition to learning models, varied media can also make learning more fun (Darmayanti & Widiani, 2023).

Based on the results of interviews and observations that have been carried out in several elementary schools in Malang City, it shows that the use of learning models has been varied, the media used by teachers are also diverse, besides that teachers have used more than one method. But in the implementation of science learning it is not in accordance with the nature of science learning, one of which is that students are invited to carry out practicum activities in the laboratory. In addition, some students also have difficulty understanding the material taught by the teacher. This is because the teacher has not designed learning that makes students active due to lack of facilities and infrastructure, teacher limitations, curriculum burden due to limited time so that they have not presented in-depth science material.

This article discusses various problems in several elementary schools in Malang City in the use of models, methods, student learning difficulties and misconceptions experienced by students. So that it can be a reference for readers to conduct similar research.

2. Method

This research is a qualitative descriptive study where the research strategy in which researchers investigate events, phenomena of individual lives and ask a person or group of individuals to tell their lives. The information obtained by the researcher will then be retold in the form of a descriptive chronology (Rusandi & Muhammad, 2021). The research subjects included 6 elementary schools in Malang City and 8 teachers and fifth grade students in each school. The research was conducted from February to April 2023. The type of data in this development research is qualitative data. Data collection techniques used in this study were interviews, observation, and questionnaires. In this study, data analysis used the Miles and Huberman data analysis model which involved the stages of data collection, data reduction, data presentation, and verification/drawing conclusions (Salim & Syahrums, 2012).

3. Results and Discussion

Based on the results of interviews with class teachers and students, several problems were found in elementary school science learning as follows.

3.1 Results

3.1.1. SDN Lesanpuro 1

Table 1. Interview Results Data

Media	Method	Model	Availability of Science Lab
2D Media, Props, Learning Videos	Lecture, Question and Answer, Games	-	Not yet available

Based on table 1, it shows that teachers have utilized various media and also used varied methods but have not used learning models. Laboratory facilities are not yet available, practicum activities are carried out in class. The results of the questionnaire given to students regarding the digestive system material showed that students experienced misconceptions on the material of the digestive process of food, based on information from the class teacher that 5th grade students actually already knew the basic theories related to the human digestive system material. It's just that maybe they haven't fully explored the material, because it also takes quite a while.

3.1.2. SDN Lesanpuro 2

Table 2. Interview Results Data

Media	Method	Model	Availability of Science Lab
Science KIT, Learning Video	Eksperiment	Cooperative, CTL	Not yet available

Table 2 shows that the media utilized by teachers are Science KIT media and learning videos, while the method used uses the experimental method. The models used are cooperative and CTL. Because the laboratory at the school is not yet available, activities are carried out in the classroom using objects around and KIT provided by the government. Meanwhile, the results of the

questionnaire about misconceptions of material on wave and sound material on sound material, in the form of students assuming that all sounds can be heard by humans, whereas in concept the sounds that can be heard by humans are sounds with certain frequencies, namely a frequency range between 20 Hz - 20,000 Hz or called audiosonic.

3.1.3. SDN Pandanwangi 3

Table 3. Interview Results Data

Media	Method	Model	Availability of Science Lab
PPT Interactive, Learning videos, Images and Teaching Aids	Q&A, Discussion	<i>Project Based Learning</i>	Not yet available

Based on table 3, the media used by teachers include interactive PPT, learning videos, pictures and props. The model used is Project Based Learning, the method is more than 1 method and laboratory facilities are not yet available. Meanwhile, based on the results of interviews conducted with the three 5th grade homeroom teachers at SDN Pandanwangi 3, it can be concluded that the Skeletal System and Human Movement material is the most difficult material in science content in grade 5 because it requires a lot of memorization and is able to distinguish the names of bones, joints, and muscles in the human skeleton. So that many experience difficulties and misconceptions on this material.

3.1.4. SDN Polehan 1

Table 4. Interview Results Data

Media	Method	Model	Availability of Science Lab
Pictures, Posters, Learning videos, teaching aids (broken)	Demonstrations, assignments and lectures	Discovery Learning	Not yet available

The interview results obtained in table 4 show that the learning model used is usually problem-based with the teacher linking motion system problems to students' daily lives, for example people close to them who are known to have functional abnormalities in their limbs. In addition, the teacher uses demonstration, assignment, and lecture learning methods which dominate the most because students need an explanation first about the skeletal or motion system in humans. Meanwhile, the teacher uses media in the form of pictures or posters and videos to support the delivery of material to students, but the teacher does not use the motion system torso because the tool is still damaged. The interview results obtained data that learning about the skeletal system or human motion system is difficult for students to understand, so students often experience misconceptions where they still like to reverse the function of joints, besides that joint movement makes students experience misconceptions between one joint and another, for example in rotating joints and ball and socket joints.

3.1.5. SDN Madyopuro 3

Table 5. Interview Results Data

Media	Method	Model	Availability of Science Lab
PPT, Flash, Video	Lectures, discussions, assignments	Discovery Learning	Not yet available

The results of interviews at SDN Madyopuro 3 in table 5 show that the media used by teachers are diverse including PPT, Flash and video. While the model used is the discovery learning model for methods utilizing lectures, discussions and assignments. Laboratory facilities are also not yet available at this school. Observation results of misconceptions are found in temperature and heat material, in examples of heat transfer, namely conduction, convection and radiation, many students experience misconceptions. In addition, in sound material students also experience misconceptions.

3.1.6. SDN Lowokwaru 3

Table 6. Interview Results Data

Media	Method	Model	Availability of Science Lab
Torso, Learning Videos dan Interactive PPT	Discussion, Experiment	Problem Solving, SAVI,	Already available

The interview results in table 6 show that the media used by teachers include torsos, learning videos and interactive PPT. While the models used are problem solving and SAVI, for discussion and experiment methods. Laboratory facilities are already available in this elementary school, but have not been maximally utilized by teachers in conducting experiments. Experiments are carried out in class to make it easier for teachers to experiment because the next hour will continue with learning materials other than science. Based on the results of the questionnaire related to student misconceptions, they experienced material on the classification of living things, precisely on the material for classifying animals based on food.

3.2 Discussion

The problems of science learning found in 6 elementary schools in Malang city include the use of media, models, methods and facilities as well as misconceptions of the material experienced by students. Data obtained from interviews with teachers show that the media used by teachers are very diverse. This media is very helpful for teachers in visualizing abstract material into reality. In addition, science material that has difficult terms when using media that is appropriate to the level of student characteristics can explain the term. Science media that can help in learning science include concrete/real objects, the natural environment, science kits, charts/pictures, learning videos, models (3D media), torsos, microscopes and IT-based media that are currently developing. This media is very much needed by teachers in clarifying concepts and understanding of elementary school students' concepts. The use of diverse media will foster students' interest in learning. This is in line with Wahyu's opinion (2020) that media that is used properly will motivate students, but in reality many media in schools are only stored and not used by teachers. Teacher skills can be improved with mentoring by LPTK to provide provisions to teachers so that each teacher has simple practical skills, this is in accordance with Sunardi & Suchyadi (2020) that by providing training to teachers can improve teacher skills in conducting simple practicums.

The learning models applied by teachers in V elementary schools in Malang City are quite varied, including cooperative models, project-based learning models, SAVI and others. These models are expected to motivate students in science learning, but based on the information obtained in following the steps of the model used, it takes quite a long time so that it has not been able to maximize the use of the model. This is in line with research conducted by Nurhayati (2020) that the cooperative learning model can improve science learning outcomes. In addition, according to Taupik & Yanti (2021) stated that the application of this Project-based learning model can improve elementary school science learning outcomes. This proves that learning models if carried out according to the correct syntax can improve science learning outcomes.

The learning methods used by teachers also vary, including lectures, discussions, questions and answers, assignments, games and experiments. This method is good if used in the science learning process in elementary schools. This method can make learning based on students. This varied learning method is expected to attract students' attention so that learning becomes more enjoyable. This is in accordance with research conducted by Trisnawaty (2017) which states that the

use of demonstration methods can make students more active in learning, besides this is also in line with the opinion of Somantri et al., (2018) which states that the experimental method is good for science learning in elementary schools. This experimental method is not limited to activities carried out in the laboratory but when students are invited to do simple practices related to the respiratory system material, for example by practicing chest and abdominal breathing in class, it is already a simple practice that can provide direct experience to students, so that students will remember the material being studied.

Facilities related to the science laboratory are only available at SDN Lowokwaru 3, while the other 5 elementary schools do not have a laboratory. The science KIT they have is placed in the teacher's room and practical activities are carried out in class. In addition, only certain materials are carried out due to limited tools and time to study the material. The limitations of tools in the implementation of practicums can be anticipated by giving students to bring simple tools that are used daily at home to do practicums at school.

The problems that occur in students are related to misconceptions of science material, every elementary school experiences misconceptions related to science material. Students actually already know the concept, it's just that the understanding of the concept is not yet deep because students only memorize the material, most students are not invited to prove if there is a misconception. Some teachers respond to misconceptions from students by providing remedial, while the right step if students experience misconceptions, students can be invited to prove through practicum activities.

3.2. Conclusion

Based on the results of interviews and observations that have been conducted in several elementary schools in Malang City, it can be concluded that several problems that occur in elementary schools include 1) Learning media that are varied but not utilized properly by teachers; 2) Implementation of various learning models, such as cooperative models, project-based learning models, SAVI (Somatic, Auditory, Visual, Intellectual), and other learning models that are not yet optimal; 3) Selection of various learning methods but teachers still cannot practice them optimally; 4) Facilities such as science laboratories that are not yet available; 5) Students' understanding of the concepts or materials explained is not yet in-depth, so that it tends to cause misunderstandings. All of these problems arise due to the lack of skills training for teachers in conducting simple practicums, limited tools and time for practice, and learning designs that tend to be monotonous so that student involvement in the learning process is passive.

The results of this study can be recommended for teacher training so that; 1) Can utilize various media in learning; 2) Science learning can be done with simple practicum activities; 3) Develop science learning resources; and 4) Optimize the limitations of learning facilities and infrastructure.

Author Contributions

This research article provides a contribution related to the problems in science learning that occur in Malang City in 6 elementary schools. The data obtained using interviews and direct observations in 6 elementary schools in Malang City with a random subject determination technique that distinguishes it from previous research conducted in other cities.

The role of the authors in this article Esti Untari: creating the initial draft of the manuscript and writing substantial parts of the article, including methods and results. Faiz Septia Fany: compiling the introduction and research methods; Maulidatul Azizah: analyzing research data; Muhammad Rofik Munawar and Nova Anisha Rahmadini; developing research results; Regita Vio Adellia; revising related to writing.

Funding

First, we would like to express our deepest gratitude to the campus, especially the Department of Elementary School Teacher Education, Faculty of Education, State University of Malang, who has given us the opportunity to participate in this activity. With this activity, we can develop our skills and knowledge. Second, we would like to express our deepest gratitude to the respondents who have helped in this research.

Declaration of Conflicting Interests

In writing this article, it is not to tell the bad things from the respondents but rather to find information that can later solve the problems experienced by the respondents. So that with this article, it can help solve the problems experienced at school.

Acknowledgement (Optional)

We would like to thank the respondents who were willing to provide information to the team so that they could compile this article well. In addition, to the co-authors who have completed the writing of the article well. To the Department of Elementary School Teacher Education, Faculty of Education, State University of Malang who has facilitated this activity well.

References

- Asyafah, A. (2019). Menimbang Model Pembelajaran (Kajian Teoretis-Kritis atas Model Pembelajaran dalam Pendidikan Islam). *TARBAWY: Indonesian Journal of Islamic Education*, 6(1), 19-32.
- Batubara, H. H. (2021). *Media Pembelajaran Digital*. Remaja Rosdakarya.
- Darmayanti, N., & Widiani, I. W. (2023). Analisis Permasalahan Dalam Pembelajaran IPA di Kelas V SDN 1 Cempaga. *DE_JOURNAL (Dharmas Education Journal)*, 4(2).
- Djamaluddin, A., & Wardana. (2019). *Belajar dan Pembelajaran 4 Pilar Peningkatan Kompetensi Pedagogis*. CV. Kaafah Learning Center.
- Elisa, D. T., Juliana, J., & Bundel, B. (2023). Analisis Karakteristik Hakikat Pembelajaran IPA di Sekolah Dasar. *Analisis Karakteristik Hakikat Pembelajaran IPA di Sekolah Dasar*, 10(1).
- Gumilar, E. (2023, Februari). Problematika Pembelajaran IPA Pada Kurikulum Merdeka di Sekolah Dasar/Madrasah Ibtidaiyah. *Jurnal Ilmiah Pedagogy*, 2(1).
- Jannah, D. R. N., & Atmojo, W. (2022). Media Digital dalam Memberdayakan Kemampuan Berpikir Kritis Abad 21 pada Pembelajaran IPA di Sekolah Dasar. *Jurnal Basicedu*, 6(1). <https://doi.org/10.31004/basicedu.v6i1.2124>
- Nurhayati, A. (2020). Pengaruh Model *Project Based Learning* (PjBL) terhadap Hasil Belajar Siswa di Sekolah Dasa. *Jurnal Basicedu*, 3(2), 524-532.
- Ramadhani, S. P., Zulela, & Fahrurrozi. (2021). Analisis Kebutuhan Desain Pengembangan Model IPA Berbasis Project Based Learning Untuk Meningkatkan Berpikir Kritis Siswa di Sekolah Dasar. *Jurnal Basicedu*, 5(4), 1819-1824.
- Rusandi, & Muhammad, R. (2021). Merancang Penelitian Kualitatif Dasar/Deskriptif dan Studi Kasus. *Al-Ubudiyah: Jurnal Pendidikan Dan Studi Islam*, 2(1), 48-60. <https://jurnal.staiddimakassar.ac.id/index.php/aujpsi/article/download/18/18>
- Safira, C. A., Setyawan, A., & Citrawati, T. (2020, Juni). Identifikasi Permasalahan Pembelajaran IPA Pada Siswa Kelas III SDN Buluh 3 Socah. *Jurnal Pendidikan MIPA*, 10(1). <https://doi.org/10.37630/jpm.v10i1.277>
- Salim, S., & Syahrums, S. (2012). *Metodologi Penelitian Kualitatif*. Citapustaka Media.
- Samatoa, U. (2016). *Pembelajaran IPA di Sekolah Dasar*. Indeks.
- Somantri, A., Djumhana, N., & Hendriani, A. (2018). Penerapan Metode Eksperimen Untuk Meningkatkan Hasil Belajar IPA Siswa Kelas V SD. *Jurnal Pendidikan Guru Sekolah Dasar*, 3(2).
- Sudarto, S., Jauhar, S., & Muin, N. F. (2024). Problematika Guru Dalam Merencanakan Pembelajaran IPA di Kelas V SD Negeri 2 Manurunge Kabupaten Bone. *JOEL: Journal of Educational and Language Research*, 3(6).
- Sunardi, O., & Suchyadi, Y. (2020). Praktikum Sebagai Media Kompetisi Pedagogik Guru Sekolah Dasar. *Jurnal Pendidikan dan Pengajaran Guru Sekolah Dasar (JPPGuseda)*, 3(2). 10.55215/jppguseda.v3i2.2737
- Taupik, R. P., & Yanti, F. (2021). Pengaruh Model Pembelajaran Project Based Learning terhadap Pencapaian Hasil Belajar IPA Siswa Sekolah Dasar. *Jurnal Basicedu*, 5(3), 1525-1531. <https://doi.org/10.31004/basicedu.v5i3.958>
- Trisnawaty, F. (2017). Peningkatkan Hasil Belajar IPA Melalui Penggunaan Metode Demonstrasi pada Siswa Kelas IV SD. *Jurnal Penelitian Pengembangan Kependidikan*, 33(1). <https://doi.org/10.24246/j.sw.2017.v33.i1.p37-44>
- Wahyu, Y. (2020, Januari). Problematika Pemanfaatan Media Pembelajaran IPA di Sekolah Dasar. 6(1). 10.29303/jppipa.v6i1.344
- Widodo, D. (2021). Peningkatan Kualitas Pembelajaran IPA Melalui Model Kooperatif Tipe Group Investigation Dengan Media CD Pembelajaran Pada Siswa Kelas V SDN Tulung 01Kecamatan Saradan Kabupaten MadiunTahun Pelajaran 2019/2020. *Educatif: Journal of Education Research*, 3(1), 131-140.

Winangun, I. M. A. (2022). Analisis Problematika Proses Pembelajaran IPA di Sekolah Dasar. *EDUKASI: Jurnal Pendidikan Dasar*, 3(1), 37-44.