

Analysis of Problems in Science Learning at The Elementary School

Zakirman^{1*}, Wienda Gusta², Chichi Rahayu³

¹Universitas Terbuka, Indonesia

²Universitas Putra Indonesia YPTK Padang, Indonesia

³Universitas Ekasakti, Indonesia

*Corresponding Author : Zakirman.official@ecampus.ut.ac.id

Article History

Received : January 08th, 2022

Revised : January 28th, 2022

Accepted : February 22th, 2022

Abstract: Natural Sciences (IPA) is a science that studies nature along with its contents. IPA becomes one of the compulsory subjects in elementary school. The aim of this study was to describe problems in IPA learning at the elementary school level in terms of child development. This type of research is qualified descriptive. Data collection is carried out by methods of observation in schools and analyzing the relationship of findings with literature studies based on expert theories and previous research. The results of information analysis and research findings are strengthened by providing recommendations for solutions in problem solving, namely the design of a relevant learning model to be applied in IPA learning in elementary school. The results of this study are expected to provide contributions and be used as a reference in the development and strengthening of the quality in IPA learning at elementary schools level. To develop a learning model which can improve the quality of IPA learning, instructional design teachers/designers can pay attention to the main problems found in this study.

Keywords: Child Development, Elementary School, IPA, Learning Problems

INTRODUCTION

Education as a process is to study situations with the main focus of interaction between learners and educators directly in a learning environment (Andirani, 2016). In this regard, the things related to development, potential and proficiency, the dynamics of behavior and student activities, especially learning behavior, become the main and important study for the educational process.

Wherever the educational process takes place, educators need children's psychiatric knowledge in helping students to be able to learn as well as possible (Wursyaytuti, 2008; Ningsih, 2009). Therefore, it is mandatory for an educator to fully understand the characteristics and traits of the protégé psychologically. The ability to understand the learning behavior of his students will explain that the child is in a state of learning well or not. This understanding can measure learning ability and the ability to receive subject matter for their students (Jannah, 2011).

Teaching means providing teaching in the form of conveying knowledge, attitudes and skills to children in order to master and develop science and technology (Zubaidah, 2004). Emphasis on the implementation of planning tasks, carrying out the teaching and learning process, and assessing the

results is a place more emphasis by teachers. To carry out this task, teachers are also required to have a set of teaching technical knowledge and skills that is having to master materials or teaching materials (Alfin, 2014; Kumape, 2009). Carrying out this teaching task, teachers are required to always look for new ideas or often called innovations, try to perfect the implementation of teaching tasks, try various methods in teaching and strive for the creation and use of props in teaching are duties in connection with professional responsibility (Susandi, 2011).

A process of effort by a person to obtain a new change in behavior as a whole, as a result of his own experience as an interaction with his environment is called by learning (Widodo, 2010; Wayan, 2009). Learning takes place as a process of mutual influence between teachers and students, between which there is a relationship. Teachers guide and on the other hand students learn. Both show balanced activity only different roles.

Every educator wants his learners to get good results in the learning process (Melly, 2017; Ardi, 2014). But to achieve it is not an easy thing, because the success of learning is

greatly influenced by many factors including teachers and learning environments. Similarly, in IPA learning, it is expected that this learning can achieve the desired target in accordance with its function. Scientific products, scientific methods, and scientific attitudes are included in the learning function of IPA in elementary school. Such scientific methods and scientific attitudes include: (1) developing and using process skills to acquire IPA concepts; (2) train students in solving problems they face; (3) cultivate the power of creation and the ability to think; (4) support IPA subjects and other subjects and help students understand new ideas or information in everyday life.

Natural Sciences (IPA) is a science that studies nature along with its contents (Djafar, 2009). IPA is defined as a collection of knowledge that serves to explain what is obtained through observation. One of the compulsory subjects in elementary school is IPA. In IPA students will learn about themselves and the environment so that it can be applied in everyday life. The purpose of IPA subjects in SD / MI is so that learners are able to develop competence and understanding of IPA concepts that are useful and can be applied in everyday life (Hutagalung, 2012).

IPA learning can actually develop the reasoning skills and analytical abilities of students (Barlia, 2011). This is because in IPA learning there are many concepts and materials related to problems that are often faced in everyday life. IPA learning can be said to have a very close environmental context with students. The illustrations or examples used in learning are very much related to everyday life.

In IPA learning, teachers can cultivate students' curiosity by displaying problems that are close to their own lives (Pawati, 2009). High curiosity is one part of the stage of child development at primary school age (Manto, 2009). This curiosity can be shown by the many questions that students ask with the sentence why, for security, what causes it, why it can be like that and so on. Ideally, teachers can direct students who have this high curiosity to be able to solve the problems faced by constructing their knowledge through existing experiences (Ermawati, 2010). Such learning, can be said to be an ideal and meaningful learning for students at the elementary school level.

Based on observations and literature studies, facts found in the field show some indications of problems in IPA learning in elementary school. These issues include:

1. IPA learning is dominated by lecture methods and makes students passive in learning activities.
2. There is a presumption from students that IPA learning is difficult because of the habit of students to consider IPA material as rote.
3. Learning carried out in class follows the flow of existing textbooks

The lecture method is one of the most commonly used methods by teachers in learning activities (Sukayasa, 2009). The popular lecture method is used because of the practicality of the method. If associated with aspects of development, the lecture method is ideally suitable for students at the level of higher class education. Lecture methods are often used by lecturers in giving lectures to students. The negative impact in the use of lecture methods in learning is to reduce the level of independence of students in learning. Students will become passive and accustomed to accepting what the teacher has given (Pawestri, 2016). In addition, in the lecture method has not optimized practicum activities that can improve students' understanding in IPA learning.

The tendency of teachers to direct students to remember will give rise to the assumption of students that IPA learning is rote (Tursinawati, 2013; Medriadi, 2011). For students in elementary school level, rote material will be considered as elusive material. Ideally in IPA learning students are invited to associate the material learned with daily life, so that students know what are the applications of the material and make the process of remembering and understanding easier. Therefore, the use of learning resources is needed to support learning activities (Eliyarti, Rahayu, & Zakirman, 2020).

IPA learning in elementary schools is also glued only to textbooks, as a result of which the information obtained by students is only centered on the contents of the book (not being extensive). Learning that is only centered on one source will also cause some material misconceptions in students (Andriani, 2008). In addition, the textbooks used are also not flexible, meaning that the content of related materials and examples is

not yet general and can be understood by students in various regions.

Based on the literature review that has been done, the solution directed to problem solving in IPA learning above is to use a cooperative learning model. Using the cooperative learning model has not been maximal in overcoming the problems that exist in IPA learning. Cooperative learning models have not maximized students' thinking skills and accommodate student curiosity. The use of cooperative learning models such as jigsaw and two stay two strays has not maximized the exploration stage in students. The syntax of this cooperative learning model further directs and focuses learning activities at the core stage and ignores the preliminary stages and closing activities.

Elementary school students with high curiosity, in the early stages of learning can be presented things related to daily life regardless of the context of learning to be taught. This can be started by bringing up problems that are not too difficult and can be solved with simple solutions from the daily student experience. In addition, for the exploration stage can be used simple practicum activities (in accordance with the level of understanding of elementary students) so that it will strengthen the understanding of the material. Based on Piaget's theory, elementary students are at a stage of concrete operational development. Children think on the basis of real/concrete experiences, not yet able to think like imagining how photosynthesis or osmosis occurs. However, the ability to perform additions, subtractions, dredifications as well as classifications have evolved with simple multiplication and division (Kesuma, Zakirman, Berli, Meilisa, & Rahayu, 2022).

Some of the problems encountered in IPA learning in school are presented in learning activities, so solutions can be proposed like the form of designing problem-based learning models that are in line with the stage of child development at elementary school age. To design the model needs to be recognized the main problem so that the model is designed appropriately to overcome existing problems. Therefore the aim of this study is to reveal the problems encountered in IPA learning in elementary school in terms of aspects of student development.

METHODS

This type of research is descriptive. The purpose of this study is to describe problems in IPA learning in elementary schools. This type of research

is qualitative descriptive. Data analysis is done by collecting information from various sources and matching the conditions in real learning in the field. The conclusion of the study is taken by analyzing between the findings and the literature studies that have been conducted. Field studies were conducted with observations at schools in Padang Pariaman Regency of West Sumatra Province.

FINDINGS AND DISCUSSION

The learning process is an interaction between teachers and students in learning a science that can be done inside or outside the classroom. Learning is also referred to as changes that occur in students in terms of abilities and student behavior that are relatively permanent as a result of the experience or training experienced. Learning is an important part of the education system that is designed to provide a learning experience for students. In addition, learning can also be interpreted as a system or process of teaching students that is structured to be carried out in such a way and ultimately evaluated systematically so that students can achieve the learning objectives that have been set effectively and efficiently (Zakirman, Gusta, & Puteri, 2021).

Students who are at the elementary school level tend to have a level of concrete thinking. To deal with classes with students who are very varied, then the way that can be done by teachers is to do general learning activities that are acceptable to all students in the class. Careful attention about the general characteristics of students can essentially help teachers to create effective, efficient, and engaging learning programs. An understanding of student characteristics will also make it easier for teachers to obtain a thorough picture of students who will pursue learning programs.

The development of elementary-age children is in two types of groups:

1. Ages 5-8 years, called fairytale time. At this time the child begins to realize himself as someone who has his own position as well as others. They begin to play together and take constructive actions. Awareness of the real environment begins to emerge, but this

objectivity is still influenced by its own subjectivity, so they like fairy tales.

- Age 9-13 years, called robinson crusoe (name of an adventurer) / playing time. At this time began to develop critical thinking, passions, competition, interests and talents. They want to know everything deeply, like to ask questions, and investigate. Their lives begin in groups, boys separated from girls. They like to tease, mock and so on until this time is dubbed the cruel time.

At this age range, when playing children connect their play environment with their personal experiences. However, children do not yet have the ability of reversible thinking to solve problems. Their minds tend to remain. Children also have not been able to see two aspects of an object or situation at once. They are also not able to reason either inductively or deductively. Children reason transductively (from special to special). Children do not yet have the concept of immortality, namely concepts related to quantity, material, breadth, weight and content. Towards this final stage, children's abilities also develop in giving reasons for what they believe. Learning that is oriented towards increasing motivation, having fun in every learning process and involving peers in building knowledge is very much liked by elementary school students (Zakirman, Lufri, Khairani, & Rahayu, 2020).

Involving students actively in learning to develop their thinking skills is an important aspect that must be considered by teachers in elementary schools. Paying attention to students' prior conceptions/knowledge that is relevant to what will be studied is the beginning that must be considered in starting science learning. Furthermore, learning activities are designed through various real activities with nature. In order for real experience activities with nature to run smoothly, they can be carried out in the classroom, in the laboratory with props or carried out directly in the open. Thus, students can develop process skills and scientific attitudes such as observing, experimenting, concluding the results of activities and communicating conclusions from their activities. In addition, providing opportunities for students to ask questions is also important in learning science. By asking children will practice expressing ideas and responses to problems faced so as to develop IPA knowledge. In addition to asking questions, students are also given the opportunity to explain a problem based on their thinking.

IPA learning in SD / MI emphasizes the provision of direct experience in accordance with reality in the environment through inquiry activities to develop process skills and scientific attitudes

(Durandi, 2009). IPA process skills given to elementary age children should be modified and simplified according to their stage of cognitive development. A child's cognitive structure is different from a scientist's cognitive structure. The learning process and development of elementary school children have a tendency to learn from concrete things, view something learned as a whole, integrated and through manipulative processes. Therefore, the IPA process skills given to elementary-age children should be modified and simplified according to their stage of cognitive development. IPA process skills to be developed include: (1) observation, (2) classification, (3) interpretation, (4) prediction, (5) hypothesis, (6) controlling variables, (7) planning and carrying out research, (8) inference, (9) application, and (10) communication.

In terms of learning objectives and the nature of science, that science can be seen as a product, process and attitude, then science learning in elementary schools must contain 3 dimensions of science. Mastery of facts, concepts, and principles about nature but also teaching problem solving methods, practicing critical thinking skills and training in drawing conclusions to be objective, cooperate and respect the opinions of others are the basis of what is taught in science learning. A learning model that adapts students' learning situations to real-life situations in the community is a learning model that is suitable for elementary school-aged children. In addition, the learning model also facilitates learning where students are given the opportunity to use learning tools and media in their environment and apply them in everyday life. (Zakirman, 2017). In fact, IPA learning does not cover three dimensions, namely: products, processes and attitudes. In addition, in IPA learning, teachers can direct and guide students to understand the material (not to memorize the material).

As a solution to the problems that exist in elementary science learning, a learning model can be designed to accommodate students' analytical thinking skills and can facilitate students' high curiosity at the elementary age level. The problem-based learning model that will be developed can pay attention to aspects of children's development at elementary age. The problem-based

learning model developed can pay attention to the following aspects, including:

1. Exploration knows everything in depth, likes to ask questions, and investigates
2. Awareness of the environment
3. Connect their play environment with their personal experiences
4. Children do not yet have the ability of reversible thinking to solve problems. Their minds tend to remain.
5. Children reason transductively (from specific to specific)

CONCLUSION

Based on the findings in research activities that have been conducted, there are several main problems in learning science at the elementary school level, including: students tend to be less active in learning at school, this is seen from learning activities dominated by teachers, concepts instilled in learning activities rather than understanding, learning activities as a whole are dominated by lecture methods, and has not involved experimental and observation activities in learning activities. To develop a learning model which can improve the quality of IPA learning, instructional design teachers/designers can pay attention to the main problems found in this study.

ACKNOWLEDGMENT

In the research activity, the author received a lot of help from various parties, therefore the author wanted to thank the principal of SDN in Nan Sabaris District of Padang Pariaman Regency as well as all teachers involved in interview and observation activities.

REFERENCES

Alfin, Jauharti (2014). Analisis Karakteristik Siswa Pada Sekolah Dasar. Prosiding Halaqoh Nasional & Seminar Internasional Pendidikan Islam Fakultas Tarbiyah dan Keguruan UIN Sunan Ampel Surabaya.

Andriani, Arnika (2016). Peningkatan Keterampilan Bercerita Melalui Penggunaan Metode Pembelajaran Paired Story Telling. *Jurnal PGSD UNS*.

Andriani, Iswah (2008). Memahami Pola Perkembangan Bahasa Anak dalam Konteks Pendidikan. *Jurnal Tadris*.

Ardi, Eka (2014). Pengaruh Metode Pembelajaran TSTS Berbantuan Media Konkret Terhadap Hasil Belajar Siswa Kelas V. *Jurnal Mimbar PGSD*.

Barlia, Lily (2011). Konstruktivisme dalam Pembelajaran Sains di SD. *Jurnal Cakrawala Pendidikan: UPI Bandung*.

Djafar, Resmin (2009). Meningkatkan Hasil Belajar Siswa pada Mata Pelajaran IPA di Kelas IV SDN Sijoli Melalui Penerapan Pendekatan Sains Teknologi Masyarakat. *Jurnal Kreatif Tadulako*.

Durandi, Winarti (2009). Meningkatkan Hasil Belajar IPA Khususnya Materi Energi dan Perubahannya Melalui Pembelajaran Quantum Teaching di Kelas V SDN Inpres Metamaling. *Jurnal Kreatif Tadulako*.

Eliyarti, E., Rahayu, C., & Zakirman, Z. (2020). Penerapan Bahan Ajar Fisika Dengan Variasi Bentuk Tugas Berbasis Web Untuk Meningkatkan Hasil Belajar Mahasiswa Teknik. *Jurnal Pendidikan Fisika*, 10(2), 82–90.

Ermawati (2010). Peningkatan Keterampilan Proses IPA melalui Model Pembelajaran Berbasis Masalah di Kelas IV SD. *Jurnal PGSD UNS*.

Hutagalung, Roninda (2012). Meningkatkan Kemampuan Bercerita Melalui Gambar dalam Pembelajaran IPA Siswa Kelas III SD. *Jurnal PGSD Unimed*.

Jannah, Miftahul (2011). Kemampuan Mahasiswa Calon Guru MI dalam Evaluasi Pembelajaran IPA. *ConferenceProceedings-ARICIS I*.

Kesuma, D. S., Zakirman, Z., Berli, A. U., Meilisa, M., & Rahayu, C. (2022). Fun Science Methods to Improve Student s ' Activeness in Science Learning. *EDUKATIF: Jurnal Ilmu Pendidikan*, 4(1), 530–538.

Kumape, Sitolin (2009). Pengaruh Penerapan Model Pembelajaran Kooperatif Tipe Two Stay Two Stray Terhadap Aktivitas dan Hasil Belajar Siswa tentang IPA di Kelas vi sd Inpres Palupi. *Jurnal Kreatif Tadulako*.

Manto, Sarkia (2009). Peningkatan Hasil Belajar Siswa pada Konsep Organ

- Tubuh Manusia Melalui Model Pembelajaran Langsung di Kelas IV SDN 02 Karamat. *Jurnal Kreatif Tadulako*.
- Medriadi, Rosane (2011). Pengembangan Model Siklus Belajar untuk Meningkatkan Kemampuan Penguasaan Aplikasi Konsep dalam Bidang Sains di SD. *Jurnal Exacta*.
- Melly, Rina (2017). Pelaksanaan Penilaian Hasil Belajar Siswa pada Subtema Hidup Rukun dengan Teman Bermain di Kelas II SDN 14 Banda Aceh. *Jurnal Ilmiah Pendidikan Guru Sekolah Dasar FKIP UNSYIAH*. Vol. 2 No 1.
- Ningsih, Suwarti (2009). Peningkatan Keterampilan Berbicara melalui Metode Bercerita Siswa Kelas III SD N 1 Beringin Jaya Kecamatan Bumi Raya Kabupaten Morowali. *Jurnal Kreatif Tadulako*.
- Pawati, Yati (2016). Motivasi untuk Meningkatkan Kemampuan Siswa Memahami Pelajaran IPA dan Bahasa Indonesia di Sekolah Dasar. *Jurnal Pendidikan Sains dan Humaniora*
- Pawestri, Lia (2016). Pengembangan Model Rangka Manusia pada Pembelajaran IPA Kelas IV SD Bakulan. *Jurnal PGSD*.
- Sukayasa, Nurmala (2009). Penerapan Model Pembelajaran Tutor Teman Sebaya untuk Meningkatkan Hasil Belajar Siswa Kelas V SDN Toli-toli. *Jurnal Kreatif Tadulako*.
- Susandi, Ari (2011). Analisis Assesmen dan Evaluasi Pembelajaran IPA di Sekolah Dasar. *Seminar Nasional Biologi, IPA dan Pembelajarannya: UM Jember*.
- Tursinawati (2013). Analisis Kemunculan Sikap Ilmiah Siswa dalam Pelaksanaan Percobaan pada Pembelajaran IPA di SDN Kota Banda Aceh. *Jurnal Pionir*.
- Wayan, Lasmini (2009). Meningkatkan Hasil Belajar Siswa Melalui Model Pembelajaran Kooperatif pada Mata Pelajaran IPA di Kelas V SDN 2 Tatura. *Jurnal Kreatif Tadulako*.
- Widodo, Sutrisno (2010). Evaluasi dalam Pembelajaran Terpadu di Sekolah Dasar. *Jurnal KTP Universitas Negeri Surabaya*.
- Wursyastuti, Sri, (2008). Inovasi Pembelajaran IPA di Sekolah Dasar. *Jurnal Pendidikan Dasar Nomor 9*.
- Zubaidah, Eni (2004). Perkembangan Bahasa Anak Usia Dini dan Teknik Pengembangannya di Sekolah. *Jurnal Cakrawala Pendidikan*.
- Zakirman, Z. (2017). Kelompok Gaya Belajar Reflektor Menurut Teori Honey Mumford Dalam Paradigma Perpustakaan. *Shaut Al-Muktabah :Jurnal Perpustakaan, Arsip Dan Dokumentasi*, 8(2), 133–142. <https://doi.org/10.15548/shaut.v9i2.112>
- Zakirman, Z., Lufri, L., Khairani, K., & Rahayu, C. (2020). The effect of using play-thinkpair-share (PTPS) model to improve student learning outcomes in magnet topic for elementary school. *IOP Conference Series: Journal of Physics*, 1481, 0–11. <https://doi.org/10.1088/1742-6596/1481/1/012078>
- Zakirman, Z., Gusta, W., & Putri, S. D. (2021). *All About To Be A Good Teacher*. Padang: Jasa Surya.