IMPROVING SCIENCE LITERACY SKILLS USING THE DEVELOPMENT OF LKPD BASED ON THE PROBLEM BASED LEARNING (PBL) MODEL IN ELEMENTARY SCHOOL STUDENTS

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Abstrak: Peringkat Indonesia terkait literasi sains belum mengalami peningkatan yang signifikan. Padahal, dalam menghadapi tantangan yang semakin berat di abad 21 ini, siswa harus memiliki kemampuan literasi. Pentingnya kemampuan literasi sains dalam pendidikan menjadikan literasi sains sebagai standar ukuran mutu pendidikan. Penelitian ini bertujuan untuk mengetahui pengaruh pembelajaran dengan menggunakan model pembelajaran berbasis masalah berbasis pengembangan LKPD terhadap kemampuan literasi sains siswa SD. Penelitian ini termasuk dalam penelitian eksperimen. Sampel sebanyak 27 siswa sekolah dasar kelas V B SDN 147 Gresik. Penelitian ini dilakukan pada bulan Maret-Mei 2023 di SDN 147 Gresik. Keterampilan literasi sains dilakukan sebanyak 2 kali yaitu pretest dan posttest. Berdasarkan uji normalitas didapatkan nilai < 0,05 yang menunjukkan distribusi data tidak normal. Hasil uji Wilcoxon signed ranks diperoleh nilai signifikansi P sebesar 0,000 < 0,05. Kesimpulan yang diperoleh adalah terdapat pengaruh pembelajaran dengan menggunakan model pembelajaran berbasis masalah pengembangan LKPD terhadap kemampuan literasi sains siswa SD. Penelitian selanjutnya memerlukan penelitian LKPD berbasis model pembelajaran berbasis masalah pada materi pembelajaran SD lainnya.

Kata-kata Kunci: Kemampuan literasi sains, pengembangan LKPD, Model PBL.

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Abstract: Indonesia's ranking related to scientific literacy has not experienced a significant increase. In fact, in facing increasingly difficult challenges in the 21st century, students must have literacy skills. The importance of scientific literacy skills in education makes scientific literacy a standard measure of the quality of education. This study aims to determine the effect of learning using the problem-based learning model-based LKPD development on elementary students' scientific literacy abilities. This research is included in the experimental research. A sample of 27 elementary school students class V B SDN 147 Gresik. This research was conducted in March-May 2023 at SDN 147 Gresik. Scientific literacy skills were carried out 2 times, namely pretest and posttest. Based on the normality test, it was found that the value was < 0.05, indicating that the data distribution was not normal. The results of the Wilcoxon signed ranks test obtained a significance value of P of 0.000 < 0.05. The conclusion obtained is that there is an effect of learning using the problem-based learning model-based LKPD development on the scientific literacy abilities of elementary students. Subsequent studies require LKPD research based on problem-based learning models on other elementary learning materials.

Keywords: Scientific literacy skills, LKPD development, PBL model

INTRODUCTION

For almost 20 years Since its release by PISA, the science literacy of students in

Indonesia has not increased significantly (Fuadi et al., 2020). The 2000 Programme for International Student Assessment (PISA) survey ranked Indonesia 38th out of 41 countries with an average score of 393 and 38th out of 40 countries with a score of 395 in 2003. Getting worse in 2009 and 2012, Indonesia was only able to rank 62nd and 64th out of 65 countries with an average score of 382. Sementara pada tahun 2015, Indonesia ranked 66th out of 72 participants (PISA, 2016). Furthermore, in 2018 with an average score of 371 with a rank of 72 out of 77 (PISA 2018 U.S. Results, 2018). Indonesia's ranking related to science literacy that has not experienced significant improvements needs more attention. Whereas in the development of science and technology in the field of public life, especially information and communication technology continues to increase in the 21st century affecting education, the challenge is that education must be able to produce human resources, especially qualified students to face various challenges in life (Yuliati, 2017). Therefore, in facing increasingly severe challenges in the 21st century, students must have literacy skillsi (Juhji & Mansur, 2020).

Science literacy is the ability to use scientific knowledge to identify questions, acquire new knowledge, explain scientific phenomena and conclude based on scientific evidence. The large dimensions of science literacy in its measurement, namely the science process, science content, and the context of science applications. Measuring science literacy is important to determine the extent of students' understanding of the science concepts they have learned (Fuadi et al., 2020). Science literacy is the ability to understand science, communicate science, and apply science skills to solve problems. In order to improve scientific literacy, in addition to motivating students, teachers should think of learning strategies that are appropriate to students' conditions and potential, and focus on transmitting direct experience and applying scientific nature in the learning process (Hidayah et al., 2019).

The importance of science literacy skills in education, making science literacy a measuring standard in the quality of science education (Ardianto & Rubini, 2016). Everyone is required to master literacy and mastery of concepts (Lintang Ayunda Putri dan Sifak Indana, 2019). However, the reality in Indonesia regarding science literacy skills in students is still relatively low. Whereas with science literacy skills , a person can use the scientific information he has to overcome problems in everyday life (Lintang Ayunda Putri dan Sifak Indana, 2019). Low literacy among students is one of the problems in the Indonesian education system (Hidayah et al., 2019). The results of a preliminary study conducted in class V B totaling 27 students, obtained data on literacy ability, namely the average score of students of 72.5 with KKM 80. Of this data, as many as 30% have been completed and 70% have not been completed. One of the efforts to overcome these problems is to improve the learning process. To make learning more interesting and fun is with learning materials in the form of Student Worksheets (LKPD) (Aristiadi et al., 2018). The results of the LKPD analysis used at UPT SDN 147 Gresik in the upper class were identified, namely the LKPD used less optimally, many LKPD did not describe the entire learning process and LKPD in the form of sheets containing questions.

LKPD used in learning determines the achievement of basic competencies (Sari et al., 2020). In addition, the LKPD used should be able to make students understand the material based on experience and information search by themselves (Aristiadi et al., 2018). LKPD is one type of print-based teaching materials. In the learning process, teaching materials are needed as a medium in the learning process to make it easier for students to understand the subject matter.Based on previous research that LKPD based on the Problem Based Learning model is a learning method that encourages students to think critically and have the ability to solve problems in the real world (Fadhila, 2022). Through PBL students gain experience in solving realistic problems, and emphasize the use of communication, cooperation, and existing resources to formulate ideas and develop reasoning skills (Nafiah & Suyanto, 2014). Penelitian terdahulu didapatkan bahwa LKPD dengan model project based learning yang dikembangkan valid dan ekektif dalam pembelajaran (Sari et al., 2020). Literacy ability can be increased using the development of LKPD oriented PBL model on reaction rate material (Asma Zainah & Muchlis, 2018). However, increasing scientific literacy using the development of

LKPD based on problem-based learning models on material changes in the form of objects is still unclear.

Based on the explanation above, this study aims to determine the effect of learning using the development of LKPD based on a problem-based learning model on the science literacy ability of elementary school students.

RESEARCH METHODS

This research is included in experimental research. The sampling technique using purposive sampling obtained samples of 27 students of SD class V B SDN 147 Gresik. This research was conducted in March-May 2023 at SDN 147 Gresik. Science literacy skills were carried out 2 times, namely pretest and posttest, so pretest was carried out at the beginning and then continued learning using PBL-based LKPD development. PBL-based LKPD has a PBL based LKPD validation result of 88.53%. After learning is complete, then proceed with a posttest to determine the ability of students' science literature after carrying out learning using PBL-based LKPD development. The pretest and posttest results will be tested for normality as a prerequisite test, and continued with hypothesis testing using the t test to determine the effect of learning PBL-based LKPD development on the science literacy ability of grade V elementary school students

RESULTS AND DISCUSSION

Result

Tabel 1. Uji Normalitas

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.311	27	.000	.752	27	.000
Posttest	.206	27	.008	.844	27	.001

Based on the results of the normality test, it was found that the results of the normality test on the pretest and posttest were with P values of 0.000 < 0.05 so that abnormal data was obtained. Therefore, the T test was further analyzed using the Wilcoxon Signed Ranks Nonparametric Test.

Based on the results of table 2 showing the results of the Wilcoxon Signed Ranks Nonparametric Test with P values of 0.000 < 0.005, there is a significant influence of learning using PBL-based LKPD development on the science literacy ability of grade V elementary school students..

Discussion

The results showed that there was a significant influence of learning using the development of PBL-based LKPD on the science literacy ability of grade V elementary school students. The results obtained in this study are almost the same as previous research that literacy skills increase using the development of LKPD oriented PBL model on reaction rate material (Asma Zainah & Muchlis, 2018). This is likely due to the suitability of PBL-based LKPD used in learning so that it can improve science literacy skills. Science literacy is the ability to understand science, communicate science, and apply science skills to solve problems. In order to improve scientific literacy, in addition to motivating students, teachers should think of learning strategies that are appropriate to students' conditions and potential, and focus on transmitting direct experience and applying scientific nature in the learning process (Hidayah et al., 2019). Science literacy skills must be enhanced using appropriate learning tools. Every school must be able to plan and prepare learning tools carefully by always paying attention to the needs of students in each school, the learning tools available are inseparable from the Student Worksheets (LKPD) used. The LKPD used determines the achievement of basic competencies (Sari et al., 2020). In addition, the LKPD used should be able to make students understand the material based on experience and information search by themselves jointsri (Aristiadi et al., 2018). LKPD is one type of print-based teaching materials. In the learning process, teaching materials are needed as a medium in the learning process to make it easier for students to understand the subject matter.Based on previous research that LKPD based on the Problem Based Learning model is a learning method that encourages students to think critically and have the ability to solve problems in the real world (Fadhila, 2022). Through PBL students gain experience in solving realistic problems, and

emphasize the use of communication, cooperation, and existing resources to formulate ideas and develop reasoning skills (Nafiah & Suyanto, 2014).

Previous research also found that worksheets developed using the project-based learning model in learning proved to be valid and effective (Sari et al., 2020). The results obtained in this study are likely due to the suitability of the PBL-based LKPD used in learning so that it can improve scientific literacy skills.

Scientific literacy is the ability to understand science, communicate science, and apply science skills to solve problems. In order to increase scientific literacy, in addition to motivating students, teachers should think about learning strategies that suit the conditions and potential of students, and focus on transmitting direct experience and applying scientific traits in the learning process (Hidayah et al., 2019). In the literacy process, students need to have the ability to understand the concepts being taught so they can solve the problems given (Erniwati et al., 2020). Having literacy skills is very important for students in dealing with changing times (Ramdani et al., 2020). Scientific literacy involves using scientific knowledge to make and find questions, get the latest knowledge, explain scientific events, and draw conclusions based on scientific facts. The measurement of scientific literacy includes the main dimensions, namely science processes, science content, and science application contexts. This measurement is important for evaluating students' understanding of the science concepts they have learned (Fuadi et al., 2020). Scientific literacy involves skills and understanding of science, communicating about science, and applying science skills in finding solutions to problems. In order to increase scientific literacy, in addition to motivating students, it is important for teachers to design learning paths that are appropriate and in accordance with students' interests and potential, and focus on direct experience and the application of scientific methods in the learning process (Hidayah et al., 2019). Scientific literacy skills enable students to use the scientific knowledge they learn as a basis for making daily decisions for students who are influenced by the development of science and technology (Prasetya et al., 2019).

Scientific literacy skills are fundamental and must be possessed by students in responding to global challenges (Ramdani et al., 2020). Scientific literacy skills enable students to use them as a basis for making decisions in their daily lives which can be influenced by the development of science and technology (Prasetya et al., 2019). Scientific literacy is very important because with scientific literacy students have the ability to adapt to developments and progress of the times (Yuliati, 2017). Scientific literacy skills must be improved using appropriate learning devices. Every school must be able to plan and prepare learning tools carefully by always paying attention to the needs of the students of each school, the available learning tools are inseparable from the Student Worksheets (LKPD) used.

The LKPD used determines the achievement of basic competencies (Sari et al., 2020). In addition, the LKPD used should be able to make students understand the material based on experience and search for information by themselves (Aristiadi et al., 2018). LKPD is one type of print-based teaching materials. In the learning process, teaching materials are needed as media in the learning process to make it easier for students to understand the subject matter.

LKPD is a student worksheet in which there are activities/tasks, instructions, and steps for solving problems (Lintang Ayunda Putri and Sifak Indana, 2019). LKPD is used as a learning resource that contains several materials to enable students to become more enthusiastic and can benefit from the learning process (Rozaliafransi, 2015). LKPD is teaching material which contains several sheets with material, summaries, and instructions that students must work on or complete. The tasks in LKPD have been adjusted to the basic competencies that must be achieved (Prastowo, 2015).

The elements contained in LKPD (Prastowo, 2015) consist of: (1) having a title; (2) learning instructions, (3) achievement indicators; (4) important information; (5) Activity steps; and (6) evaluation. Meanwhile, Widyantini (2013) said that LKPD is teaching material that has elements, namely: (1) a title; (2) there are folders; (3) semester (4) location, (5) learning instruction, (6) competency achievement; (7) achievement indicators; (8) supporting information; (9) the

logistics used; (10) activity steps, and (11) evaluation. In this study, the LKPD that was developed included elements of learning guides, KD, achievement indicators, concept maps, tools and materials, activity steps, assignments, and assessments.

Based on previous research, LKPD based on the Problem Based Learning model is a learning method that encourages students to think critically and have the ability to solve problems in the real world (Fadhila, 2022). This shows if the LKPD combined with PBL is appropriate, so it is a permanent solution in overcoming low scientific literacy. Therefore PBL is the right method to apply,

Each learning model has its own characteristics or features (specificity regarding what and how the learning process will take place). The characteristics of the PBL model are as follows: 1) There are problems; 2) Focusing on interdisciplinary links; 3) Seriously carry out investigations; 4) The final result is in the form of a product or work and is exhibited; 5) Collaboration or cooperation. Problem-based learning begins with the submission of questions or problems regarding real-life situations that allow students to find solutions to these problems in groups by reviewing the various knowledge they have. In finding solutions or solving problems, students are required to carry out scientific investigations, then present these solutions and communicate them (Adriadi & Naf'an Tarihoran, 2016).

The problem based learning (PBL) model has the advantage of providing special learning experiences for students because it actively involves them. PBL encourages students to be directly involved in solving a given problem. In PBL learning, all activities carried out by students must have a systematic approach. This is important to help students overcome the problems and challenges they face in their daily lives and in their future careers (Sari et al., 2020). The importance of PBL in preparing students to face life and career challenges. Thus, the problem based learning model provides opportunities for students to be actively involved in learning, develop skills in finding solutions to problems, and become independent learners. The systematic approach used in PBL helps students face real challenges in their daily lives and in their future (Shofiyah et al., 2018). In addition, through PBL students gain experience in solving realistic problems, and emphasize the use of communication, collaboration, and existing resources to formulate ideas and develop reasoning skills (Nafiah & Suyanto, 2014).

Based on the discussion above, it shows that learning using a problem-based learning model based on LKPD development on the scientific literacy abilities of elementary school students has proven to be influential. This shows that elementary school teachers can apply problem-based learning based on LKPD development to increase student literacy. Therefore LKPD based on the PBL model can be used by teachers in overcoming low student literacy.

CONCLUSION

This study revealed that students experience academic burnout which is influenced by several factors, one of which is student self-efficacy, adding evidence that academic fatigue is a warning signal for a decline in student academic achievement on campus. Therefore, it is recommended by the institution to facilitate students and encourage students to cooperate with interprofessional, collaboration, and communication.

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