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Liveworksheet-Based E-LKPD and Interest in Learning Improves Science and Social Learning Outcomes for Elementary School Students

Tika Fahmi Afifah[1*], Akhmad Junaedi[2]

[1,2] Pendidikan Guru Sekolah Dasar , Universitas Negeri Semarang , Indonesia

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ABSTRAK

Penelitian ini dilatar belakangi oleh siswa yang kesulitan dalam memahami materi pembelajaran. Hal ini berdampak pada rendahnya hasil belajar siswa karena penggunaan media belajar yang kurang kreatif dan inovatif di kelas IV SD. Penelitian ini bertujuan untuk menganalisis pengaruh E-LKDP berbasis lembar kerja langsung dan minat belajar terhadap hasil belajar IPS siswa kelas IV sekolah dasar. Desain penelitian ini menggunakan jenis penelitian kuantitatif. Metode penelitian yang digunakan dalam penelitian ini adalah dengan metode penelitian korelasional. Populasi dalam penelitian ini berjumlah 132 siswa. Teknik sampling yang digunakan dalam penelitian ini yaitu Probability Sampling dengan jenis Simple Random Sampling. Metode yang digunakan dalam megumpulkan data yaitu wawancara, angket, dan dokumentasi. Instrumen penelitian ini yaitu angket dan dokumentasi. Teknik yang digunakan untuk menganalisis data yaitu analisis statistik deskriptif, uji prasyarat analisis, dan uji hipotesis. Hasil penelitian yaitu terdapat pengaruh E-LKPD berbasis liveworksheet dan minat belajar terhadap hasil belajar siswa kelas IV pada mata pelajaran IPAS. Disimpulkan bahwa E-LKPD berbasis liveworksheet dapat meningkatkan hasil belajar siswa kelas IV pada mata pelajaran IPAS.

ABSTRACT

This research was motivated by students who had difficulty understanding the learning material. This impacts low student learning outcomes due to using less creative and innovative learning media in grade IV elementary school. This study aims to analyze the influence of direct worksheet-based E-LKDP and interest in learning on social studies learning outcomes for fourth-grade elementary school students. This research design uses a quantitative type of research. The research method used in this research is the correlational research method. The population in this study was 132 students. The sampling technique used in this research is Probability Sampling with the Simple Random Sampling type. The methods used to collect data are interviews, questionnaires and documentation. The instruments used in this research are questionnaires and documentation. The techniques used to analyze data are descriptive statistical analysis, analysis prerequisite tests, and hypothesis testing. The research results show that the influence of live worksheet-based E-LKPD and interest in learning on the learning outcomes of class IV students in science subjects is significant. It was concluded that live worksheet-based E-LKPD can improve the learning outcomes of class IV students in science subjects.

1. INTRODUCTION

The main activity carried out at school is studying. Learning is characterized as a continuous process of behaviour modification caused by experience and practice (Ilhamdi et al., 2020; Maskur et al., 2020). Changes in knowledge, skills and attitudes are part of the learning process. When individuals interact with the environment to fulfil their needs, learning occurs as a change in behaviour (Pamungkas et al., 2021; Widayanti et al., 2019). A person's behaviour during the learning process can vary based on how he responds to certain circumstances and internal processes. Learning requires long-term behaviour modification resulting from active engagement with the environment (Manullang & Silitonga, 2022; Pahlawati & Sofyan Zain, 2021; Zain & Putra, 2020). Therefore, teachers must be able to design innovative learning activities that can change student behaviour, knowledge, abilities and attitudes. One of the subjects that students learn in elementary school is Natural and Social Sciences (IPAS). Natural and Social Sciences (IPAS) aims to equip students with the information and skills to understand and explain various natural and social phenomena (Saadah et al., 2022; Silvia et al., 2023). To ensure that students learn as actively and effectively as possible during the science and science learning process, teachers must be able

*Corresponding author.
E-mail addresses: tikafahmiafifah@students.unnes.ac.id (Tika Fahmi Afifah)

to manage the class so that they can foster students' interest in learning (Muhardini et al., 2023; Wanti & Chastanti, 2023). Interest in learning is a curiosity that encourages someone to study a particular object or activity (Putri et al., 2019; Yulistiarawati et al., 2021). This causes interest in learning to become an essential component of teaching and learning. Interest in learning is a student's encouragement or desire to study certain subjects (Rusniasa et al., 2021; Sari, 2020). Students with a high interest in learning will be more motivated to learn and achieve optimal results (Kamardana et al., 2021; Oktaviani & Halim, 2021). Interest in learning is a person's natural desire to acquire knowledge and skills without external pressure, which can produce positive changes in knowledge, skills and behaviour. If learning materials are adapted to the needs of each student, taking into account their experience, abilities and development, and using various learning models and techniques, then interest in learning will increase (Oktaviani & Halim, 2021; Rusniasa et al., 2021; Sari, 2020). Previous research findings also reveal that students' interest in learning can increase if teachers design suitable learning activities (Rasam & Sari, 2018; Sunardin & Kasma, 2023). However, currently, there are still many students who have a low interest in learning. This is reinforced by previous findings, which reveal that many students are less interested in learning because teachers are less innovative (Dewa et al., 2020; Hidayaty et al., 2022). Other research also reveals that one of the factors causing students' low interest in learning is the lack of learning media available to students (Putri et al., 2019; Wulandari, 2022; Yulistiarawati et al., 2021). The observations and interviews conducted at Jendral SD Gugus Sudirman also found problems regarding students' low interest in learning science and technology. The results of interviews with teachers found that there were still many students who felt bored when participating in learning activities in class. The interviews with students also found that when the teacher explained the learning material, they felt bored and sleepy and did not focus when studying. Apart from that, teachers still lack the application of exciting learning media to help students learn anywhere. This causes students' interest in learning to be low, resulting in learning outcomes below standard.

Based on these problems, teachers can implement solutions by using innovative learning media. Learning media facilitates understanding, increases the efficiency and effectiveness of learning outcomes, and achieves educational goals (Pratiwi & Tirtayani, 2021; Putra & Ishartiwi, 2015; S. Wulandari, 2020). Learning media refers to everything that functions as an intermediary between teachers who provide information and students who receive information to stimulate students' motivation and enable them to participate fully and meaningfully in the learning process (Ahmadi et al., 2017; Sugandi & Rasyid, 2019). Mastery of learning media by teachers is an integral part of pedagogical competence. Teachers' mastery of learning media is one of the keys to realizing quality and practical learning and helping students achieve their maximum learning potential (Ayu & Manuaba, 2021; Salmia & Yusri, 2021). One of the learning media that teachers can use to increase students' interest in learning is Liveworksheet-based E-LKPD. Liveworksheet-based Electronic Student Worksheets (LKPD) are a learning resource that can improve student learning outcomes in science subjects. Electronic Student Worksheets (LKPD) are teaching materials developed to facilitate students learning (Rizkika et al., 2022; Ketut Sri Puji Wahyuni et al., 2021; Wardani & Suniasih, 2022). The LKPD was developed according to essential competencies and equipped with instructions for use, time allocation, and practice questions (Apriyanto et al., 2019; Putra et al., 2021). LKPD was developed using the Google website, namely the live worksheet, which allows students to solve problems based on the essential competencies they want to achieve. Apart from that, E-LKPD also builds knowledge and problem-solving abilities (Puspita & Dewi, 2021; Salsabila et al., 2023). Liveworksheet-based E-LKPD is an interactive learning media accessed via the internet and equipped with various exciting features such as animation, video and simulation (Salsabila et al., 2023; Yuniasih & Nita, 2021). Students can understand the material more effectively and realistically using this learning media.

Previous research findings state that E-LKPD can help students learn to increase their enthusiasm and interest in learning (Maharani Zan & Mardian, 2022; Pribadi et al., 2021). Other research also states that E-LKPD can make it easier for students to absorb information about learning material so that it can significantly improve student learning outcomes (Puspita & Dewi, 2021; Wardani & Suniasih, 2022). LKPD has several advantages, such as activating students more and minimizing the role of the teacher, increasing students' understanding of the material, and being a concise and task-rich teaching material that can make it easier to carry out teaching and learning activities. Apart from that, LKPD is also environmentally friendly because it does not use paper, ink, etc., and is always available because it is digital. However, there has been no study regarding live worksheet-based E-LKPD on the interest and learning of science and science for fourth-grade elementary school students. Based on this, this research aims to analyze the influence of live worksheet-based E-LKPD and interest in learning on the learning outcomes of fourth-grade elementary school students.

2. METHODS

This research design uses a quantitative type of research. The research method used in this research is the correlational research method. This research was carried out in one of the clusters in the Pengadegan sub-district, Purbalingga Regency. This research uses three variables, consisting of two independent variables and one dependent variable. The independent variables in this research are live worksheet-based E-LKPD (X1) and interest in learning (X2). The dependent variable in this research is learning outcomes (Y) obtained from the Final Semester Assessment (PAS) odd sciences for class IV elementary school students in the Jendral Sudirman Cluster, Pengadegan District, Purbalingga Regency. The population in this study were all fourth-grade elementary school students in the Jendral Sudirman Cluster, Pengadegan District, Purbalingga Regency, with a total of 132 students. The sampling technique used in this research is Probability Sampling with the Simple Random Sampling type. The research was conducted at elementary schools in the Jendral Sudirman Cluster, Pengadegan District, Purbalingga Regency, which consists of six elementary schools with relatively homogeneous class IV students. The methods used to collect data are interviews, questionnaires and documentation. This research conducted interviews with fourth-grade elementary school teachers in the Jendral Sudirman Cluster, Pengadegan District, Purbalingga Regency. The questionnaire in this research was guided by live worksheet-based E-LKPD indicators and students' learning interests. Documentation data in this research was used to obtain data relating to the number of students, names of students, and final grades for odd semester class IV science subjects at elementary schools in Gugus Jendral Sudirman, Pengadegan District, Purbalingga Regency. The instruments used in this research are questionnaires and documentation. The research instrument grid is presented in Table 1.

Table 1. Liveworksheet Based E-LKPD Questionnaire Grid

No.	Dimensions	Indicator
1.	Content Quality	Easy operating instructions
		Suitability of the material presented
2.	Appearance	Suitable use of color
		Suitability of image/video illustrations
		Clarity of text type and size
3.	Language	Accuracy of language use
4.	Benefits of Liveworksheet Based E-LKPD	Interest in learning from student responses
		Smooth learning process

Table 2. Learning Interest Questionnaire Grid

No.	Dimensions	Indicator
1.	Feeling happy	Students' views/opinions about science lessons.
		Students' feelings while taking science lessons.
		Students' opinions about teachers.
2.	Student Engagement	Activeness while studying science.
		Awareness of learning science at home.
3.	Interest	Student responses to the assignments given.
		Curiosity towards science lessons.
4.	Student Attention	Students' attention when studying in class.

The techniques used to analyze data are descriptive statistical analysis, analysis prerequisite tests, and hypothesis testing. Descriptive analysis is statistics used to describe the object being studied through data collected from the population or sample as it is (Sugiyono, 2016). The data collection process for learning outcomes (Y) is by taking the final odd semester assessment documentation results for class IV science subjects. This value was obtained from the fourth-grade elementary school teacher in Gugus Jendral Sudirman, Pengadegan District, Purbalingga Regency. A descriptive analysis of learning discipline (X1) and student interest in learning (X2) was carried out using index analysis. Prerequisite Test data analysis is carried out before final analysis or hypothesis testing. This research uses four analysis prerequisite tests, namely the basic assumption test and the classic regression assumption test. The basic assumption test consists of 1) the normality test and 2) the linearity test. The second type is the classic regression assumption test, namely the 3) multicollinearity and 4) heteroscedasticity tests. The hypothesis testing technique in this research uses several analytical techniques, namely 1) simple correlation analysis, 2) simple linear regression analysis, 3) multiple correlation analysis, 4) multiple

regression analysis, 5) determination analysis, and 6) joint regression analysis (F test). This analysis technique was used so that the research could describe the relationship between how much influence the live worksheet-based E-LKPD and interest in learning had on the science and science learning outcomes of fourth-grade students at Gugus Jendral Sudirman Elementary School, Pengadegan District, Purbalingga Regency.

3. RESULT AND DISCUSSION

Results

This research aims to analyze the influence of live worksheet-based E-LKPD and interest in learning on the learning outcomes of fourth-grade elementary school students. The live worksheet-based E-LKPD score includes a score range of 51, a minimum score of 17, a maximum score of 68, and an average score of 53.05. This shows that in the live worksheet-based E-LKPD questionnaire, there were students with the lowest score of 17 and the highest score of 68, a score range of 51, and an average questionnaire score of 53.05 from the 100 students recruited as research samples. Based on the live worksheet-based E-LKPD variable index calculation, the result was 79.4%. Based on the criteria according to the Three Box Method, the index value of the live worksheet-based E-LKPD variable is 79.4%, which is included in the high category. The lowest index value is found in the live worksheet-based E-LKPD benefit indicator, with a percentage of 76.15%. This shows that the usefulness of E-LKPD is still low when learning using live worksheet-based E-LKPD media. Apart from that, the content quality indicator in the live worksheet-based E-LKPD received a percentage of 79.5%, which shows that students are happy with the live worksheet-based E-LKPD media. The display indicator obtained a percentage of 78.45%, which means students were interested in the display and features used in the live worksheet-based E-LKPD. The linguistic indicator obtained 83.5%, which shows that the language used in the live worksheet-based E-LKPD is easy for students to understand and follow. Based on the live worksheet-based E-LKPD variable index calculation, the overall result was 79.4%. Thus, it can be concluded that live worksheet-based E-LKPD is in the high category and can be applied in learning activities to create an active and enjoyable learning atmosphere.

The results of the data analysis show that students' learning interest scores include a score range of 43, a minimum score of 31, a maximum score of 74, and an average score of 58.77. This shows that in the interest in learning questionnaire, there are students with the lowest score of 31 and the highest score of 74, a score range of 43, and an average questionnaire score of 58.77 out of 100 students used as a questionnaire research sample. Based on the calculation of the learning interest variable index, the result was 77.66%. The student interest variable index value of 77.66% is included in the high group based on the Three Box Method criteria. The lowest index is found in the enthusiasm indicator for science subjects, with a percentage of 73.96%. The indicator of student involvement in science subjects was 79.43% because students were still less active in the learning, whether asking or answering questions from the teacher or other students. The indicator of student interest in science subjects obtained a score of 77.13%. The attention indicator for science and science subjects obtained the highest percentage, namely 80.13%, supported by the use of live worksheet-based E-LKPD media in learning activities. Based on the calculation of the learning interest variable index, the overall result was 77.66%. Thus, the conclusion is that interest in learning is in the high category, so that it can improve student learning outcomes. This statement is supported by the high interest of students in learning and the use of live worksheet-based E-LKPD in student learning, which has caused students to become increasingly interested in taking IPAS subjects.

The results of data analysis show that the minimum PAS learning outcome score in science subjects is 30, the maximum score is 100, the data range is 70, and the average score (mean) is 73.45. Based on the 5-scale conversion guideline table, the average PAS score for class IV science subjects is 73.45, which meets the requirements of B (Good). Student scores increased after carrying out science learning activities using live worksheet-based E-LKPD learning media in class IV Jendral. Gugus Sudirman Elementary School. This improvement can be seen through the evaluation of learning outcomes. The minimum learning outcome score in the science subject evaluation is 60, the maximum score is 100, the data range is 40, and the average score (mean) is 88.55. This shows that some students still get test results below the Minimum Completion Criteria (MMC). If you look at the scale five conversion guideline table, the average grade IV IPAS evaluation score is 88.55. This means that the learning outcomes of class IV students are at qualification A (Very Good). The overall learning results of class IV Jendral students at SD Gugus Sudirman Pengadegan Purbalingga showed an increase in scores from an average of 73.45 before using live worksheet-based E-LKPD to 88.55 after learning using live worksheet-based E-LKPD learning media. Data Normality Test Results are presented in Table 3.

Table 3. Data Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		100
Normal Parameters[a,b]	***Mean***	.0000000
	Std.Deviation	15.65802947
Most Extreme Differences	***Absolute***	0.064
	Positive	0.060
	Negative	-.064
Test Statistic		0.064
Asymp. Sig. (2-tailed)[c]		0.200[d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

The results of the analysis of normality test data on the output of IBM SPSS Statistics 29 showed that the residual values were normally distributed (Sig (2-tailed) = 0.200 > 0.05). Next, a data multicollinearity test was carried out. The multicollinearity test results obtained using IBM SPSS Statistics 29 show that the learning media (live worksheet-based E-LKPD) has a VIF value of 1.034 < 10 and a tolerance value of 0.967 > 0.10. This shows no multicollinearity based on the calculation results between one variable and another variable. Data Multicollinearity Test Results are presented in Table 4.

Table 4. Data Multicollinearity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	16.930	12.916		1.311	0.193		
	Learning Media	0.474	0.179	0.250	2.653	0.009	0.967	1.034
	Learning Interest	0.534	0.179	0.281	2.982	0.004	0.967	1.034

The scatterplot results of this research show that there are points that are distributed unevenly, located below zero on the Y axis. This shows that heteroscedasticity does not occur. Based on existing data, it can be concluded that the research conducted by researchers has met heteroscedasticity standards, meaning that heteroscedasticity does not occur. The results of the data autocorrelation test showed that the Durbin-Watson (d) value was 1.774, so it was compared with the significant table value (0.05) for a sample size of 100 with two independent variables (Learning Interest and Liveworksheet-Based E-LKPD). The Durbin-Watson calculation produces the following results: 1.715 < 1.774 < 2.285, with the Durbin-Watson (d) value being greater than the dU value and the Durbin-Watson (d) value being smaller than the 4-dU value. Based on this statement, the conclusion that can be drawn is that there is no autocorrelation. The results of the Multiple Linear Analysis Regression Test are presented in Table 5.

Table 5. Multiple Linear Analysis Regression Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.930	12.916		1.311	0.193
	Learning Media	0.474	0.179	0.250	2.653	0.009
	Learning Interest	0.534	0.179	0.281	2.982	0.004

The constant value (a) of 16.930 indicates that learning outcomes increase by 16.930 if interest in learning and learning media is worth 0. Interest in learning (X2) is 0.534, while the standard coefficient value of live worksheet-based E-LKPD (X1) is 0.474. These figures show that the direction of the regression is positive, meaning that learning outcomes are positively influenced by learning media (live worksheet-based E-LKPD) and interest in learning. Other independent variables not included in the research model are symbolized by error (e). Based on the findings of the multiple linear regression analysis test table processed with IBM SPSS Statistics 29, it is known that the learning media variable (live

worksheet-based E-LKPD) has a significance level of 0.009 and a calculated t value of 2.653 > t-table 1.985. At a significance level of 0.004, the variable interest in learning has a calculated t value of 2.982 > t table 1.985. These findings indicate that learning outcomes (Y) are influenced by learning media variables (X1) and learning interest (X2). The F test results are presented in Table 6.

Table 6. F Test Results

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4451.306	2	2225.653	9.710	<0.001
	Residual	22233.444	97	229.211		
	Total	26684.750	99			

Using IBM SPSS Statistics 29, the F test produces findings of F-value 9.710 > F-table 3.09 and a significance level of 0.001 < 0.05 or 5%, indicating rejection of H0 and acceptance of Ha. This shows that learning outcomes are significantly influenced by learning media (live worksheet-based E-LKPD) and interest in learning. The coefficient of determination test results shows that the R-value is 0.408 and the R Square value is 0.167, which can be interpreted as 16.7%. These results show that the independent variables learning media (X1) and interest in learning (X2) have an influence of 16.7% on the dependent variable learning outcomes (Y), and other variables outside learning influence the remaining 83.3%. The model used in this research.

Discussion

The data analysis found an influence of live worksheet-based E-LKPD and interest in learning on the learning outcomes of fourth-grade elementary school students in Jendral. Several factors cause this. First, live worksheet-based E-LKPD can increase students' interest in learning. Electronic student activity sheets (E-LKPD) are student activity sheets that contain practice questions that can be done anywhere and anytime so that learning activities become practical (Rizkika et al., 2022; Ketut Sri Puji Wahyuni et al., 2021). Easy learning activities certainly impact students' increasing interest in learning. Liveworksheet is a platform that helps teachers create electronic LKPD that allows students to solve problems themselves based on the essential competencies they want to achieve (Khikmiyah, 2021; Nadifatinisa & Sari, 2021). This allows students to develop a high interest in learning. Previous research findings also state that with this LKPD, you can analyse research data by improving students' creative thinking skills (Prasetya Subakti et al., 2021; Sutrimo et al., 2019). E-LKPD with attractive colours and designs containing lesson material, interactive questions and also video explanations of the material to increase student enthusiasm.

Second, live worksheet-based E-LKPD can improve student learning outcomes. LKPD development is an activity that details and describes the activities entirely and clearly for each component in the LKPD (Prasetya Subakti et al., 2021; Rewatus et al., 2020). The purpose of this LKPD was to formulate learning objectives in a complete, precise and operational manner with material components in the form of explaining concepts and providing examples and pictures (Kinanti et al., 2021; Rizalini & Sofyan, 2018). E-LKPD is a learning product or tool used for the learning process. Previous research findings also reveal that E-LKPD can help improve student learning achievement (Ernawati et al., 2018; Rai et al., 2021). The aim of E-LKPD is to advance the learning process by encouraging students to think critically and be more active when solving contextual problems. The existence of E-LKPD can train students in critical skills both effectively, validly and practically (Prasetya Subakti et al., 2021; Sutrimo et al., 2019). Third, live worksheet-based E-LKPD can increase a pleasant learning atmosphere. Using E-LKPD helps students make the learning process easier. The use of E-LKPD using applications or software is a highly recommended learning medium because it can teach new things and can also take advantage of technological sophistication, and students can improve technological developments in the era of revolution 4.0 (Putra & Agustiana, 2021; Satura et al., 2021). The benefits of E-LKPD as teaching materials for the learning process for students are that it makes learning more accessible and makes it easier to study anywhere and anytime using just a smartphone, laptop or computer (Octaviana et al., 2022; Susiana, 2021). Learning activities that can be carried out anywhere can increase a comfortable learning atmosphere and suit students' needs. The use of E-LKPD involves students being able to directly watch learning videos, read material, be able to carry out experiments, discussions and also answer existing questions in E-LKPD activities (Puspita & Dewi, 2021; Wahyuni et al., 2021). This certainly has an impact on a comfortable and facilitated student learning atmosphere. Previous research findings also reveal that using E-LKPD can foster students' enthusiasm for learning (Pribadi et al., 2021; Salsabila et al., 2023). Other research also explains that E-LKPD can make it easier for students to learn (Hidayah et al., 2020; Putri et al., 2022). It can be concluded that live worksheet-based E-LKPD can improve student learning

outcomes. The advantage of using E-LKPD is that it trains students to have fun learning. It is not only about doing questions but also an explanation of the material and a learning video. Then, students can conduct experiments and discuss and answer questions available in E-LKPD activities. The limitation of the research is that it only analyzes the influence of live worksheet-based E-LKPD and interest in learning on the learning outcomes of fourth-grade elementary school students. This research implies that using E-LKPD makes it easier for students learning mathematics to solve problems and assignments anytime and anywhere based on the E-LKPD that has been presented. The application of E-LKPD provides increased motivation and interest in learning and mathematical abilities in students.

4. CONCLUSION

Based on the results of research and data analysis regarding the influence of live worksheet-based E-LKPD and interest in learning on learning outcomes, it was found that there was an improvement compared to learning before using live worksheet-based E-LKPD as a learning medium. Live worksheet-based E-LKPD and interest in learning influence the learning outcomes of fourth-grade elementary school students in Jendral. It was concluded that E-LKPD based on live worksheets and interest in learning can improve the learning outcomes of fourth-grade elementary school students.

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