Journal of General Education and Humanities
Vol. 5, No. 1, February 2026, pp. 1307 – 1317, https://doi.org/10.58421/gehu.v5i1.1137
ISSN 2963-7147

The Effect of Child-Friendly Joyful Learning on Data Processing Materials on the Mathematical Analysis Skills of Grade VI Students of Madrasah Ibtidaiyah

Muhammad Fiqri Alwi[1], Rora Rizky Wandini[2]
[1,2]Universitas Islam Negeri Sumatera Utara, Indonesia

Article Info

Article history:

Received 2026-01-04
Revised 2026-02-08
Accepted 2026-02-11

Keywords:

Data Processing
Elementary Madrasah
Joyful Learning
Mathematical Analysis Skills

ABSTRACT

Many elementary school students encounter difficulties in developing mathematical analytical abilities, especially in data processing topics, largely because classroom instruction tends to be teacher-centered and limits active student participation. This research was conducted to investigate the impact of implementing a child-friendly Joyful Learning approach on the mathematical analysis skills of sixth-grade students in an Islamic elementary school. The study applied a quantitative method using a quasi-experimental design. A total of 70 sixth-grade students from MIN 4 Medan City participated in the study and were divided into an experimental group and a control group. The experimental group received instruction through the child-friendly Joyful Learning model, whereas the control group was taught using conventional teaching methods. Data collection techniques included classroom observations and an essay-based test designed to measure students' mathematical analytical abilities. The collected data were analyzed using normalized gain (N-gain) calculations and an Independent Samples T-Test. The findings revealed that the experimental group obtained a high N-gain score of 0.84, while the control group achieved a moderate score of 0.35. Furthermore, the hypothesis testing indicated that the computed t-value was significantly higher than the critical value at a significance level of $p < 0.001$, demonstrating a statistically significant difference between the two groups. These results indicate that the child-friendly Joyful Learning model effectively improves students' mathematical analytical skills in data processing material. Consequently, this instructional model can serve as a viable alternative strategy for enhancing mathematics achievement at the elementary education level.

Corresponding Author:

Muhammad Fiqri Alwi
Universitas Islam Negeri Sumatera Utara, Indonesia
Email: muhammad0306213176@uinsu.ac.id

1. INTRODUCTION

Mathematics learning is a constant aspect of every educational program. Mathematics is a subject taught from elementary school to university. Mathematics is a subject studied at all levels of education. Mathematics is also a branch of science that helps improve students' critical, logical, and mathematical thinking skills. This is because in the mathematics learning process, students are required to solve problems using critical and logical thinking. Therefore, mathematics is crucial, as stipulated in Article 37 of Law of the Republic of Indonesia Number 20 concerning the National Education System. Mathematics is a compulsory subject from elementary school to high school [1], [2]. Thus, mathematics not only functions as a body of knowledge but also as a fundamental tool for developing higher-order thinking skills that are essential for students' academic and real-life problem solving.

Mathematics learning at the elementary level is considered a crucial subject for equipping students with calculation and data-processing skills. It is also needed to support students' thinking and develop their analytical skills. Data processing plays a key role in developing students' analytical skills. Students are required to present data, determine the arithmetic mean and mode of a data set, sort data, and interpret the results of data processing [3], [4]. At this stage, students begin to build foundational competencies that will influence their ability to understand more complex mathematical concepts in higher grades.

Problems frequently encountered by students in data processing include difficulty converting available data into tables and diagrams; difficulty creating pie charts; difficulty determining the degree and drawing the sectors of a circle; difficulty reading and interpreting data in tables or diagrams; and difficulty determining the mean, median, and mode. These problems arise because teachers have not optimized student abilities and have not recognized that each student has a different learning style. Lack of student engagement can also be caused by teachers' lack of variety in applying various methods, strategies, and models. Therefore, it can be concluded that teachers must improve their teaching methods and quality, as data processing can develop mathematical analytical skills tinggi [5], [6], [7]. [8] [9]. If these instructional issues are not addressed, students' analytical development may stagnate and negatively affect their overall mathematics achievement.

Research conducted by Dwi Hurriyati found that the average student grade increased from 60.5 to 68.7 after implementing the Joyful Learning method, accompanied by an increase in the number of students with high scores Similar research by Annisa Ramadhani showed that 26 out of 34 students experienced increased learning interest and 21 students experienced improved mathematics learning outcomes, proving that this method creates a pleasant learning environment and improves student achievement. Meanwhile, research by Nurin Arindyah Putri also demonstrated a significant effect of the Joyful Learning method on students' numeracy skills in fractions, with a significance value of $0.004 < 0.05$, indicating that this method is effective in improving students' mathematics learning abilities [10], [11], [12]. These findings collectively indicate that Joyful Learning has the potential to address learning difficulties by increasing both students' motivation and academic performance.

This suggests that the most influential factor in improving students' mathematical analysis skills is the mathematics teacher. Many teachers are proficient in mathematics but lack the skills to convey their knowledge to students. This is a problem that teachers must prioritize. Without mathematical analysis skills, students' learning tends to be only temporarily remembered, and they find it difficult to restate the material. Teachers need to use learning models that can increase students' desire to learn, so they feel compelled to participate in the learning process. One way to foster this sense of learning is through enjoyable classroom interactions [13], [14]. Therefore, selecting an appropriate instructional model becomes a strategic decision in enhancing students' analytical competence.

The learning model is a supporting factor in the process of transferring knowledge from teachers to students. One alternative learning model that supports these conditions is the Joyful Learning model. Joyful learning is a model that creates a fun, cheerful, and active learning environment, engaging students. Furthermore, joyful learning is a strategy for developing students' skills and understanding, emphasizing learning by doing. Joyful learning can help develop students' mathematical analysis skills in a fun way. The enjoyable learning process will provide students with positive feedback and shape their character. The goal is to make the learning process interactive, encouraging students to be more active, creating a fun environment, and creating a space where students can develop their talents, interests, creativity, skills, and psychological development [15], [16]. By integrating cognitive and emotional aspects of learning, this model is expected to produce more meaningful and lasting understanding.

However, the Joyful Learning approach also has shortcomings in its implementation. In this model, teachers are expected to be highly creative to prevent students from quickly becoming bored during the learning process and to keep them focused on the learning concept. However, this shortcoming can be overcome by providing teachers with training and workshops to enhance creativity and innovative teaching skills. Furthermore, teachers can use a variety of engaging and enjoyable learning media to maintain a conducive learning environment. With adequate professional development, the potential weaknesses of this model can be minimized while maximizing its instructional benefits.

Student learning is oriented toward developing thinking skills, constructing their own concepts of the material, and enabling students to formulate conclusions. Exposing students to engaging situations can foster their interest in the material by making the learning process more dynamic, visual, and engaging. This, in turn, fosters student motivation. Learning motivation is crucial for students because it significantly influences how much they learn from a learning activity and how much they absorb the information presented. Motivated students tend to demonstrate higher persistence, better concentration, and improved analytical performance.

Implementing Joyful Learning in mathematics can be achieved through the PAKEM strategy, which focuses on active, enjoyable learning. According to Trinova, indicators of enjoyable learning are as follows: (1) Full attention or focus, enthusiasm, passion, and high concentration; (2) Courage to try/do something, question something, and not be afraid to do something; and (3) Visible facial expressions of happiness, joy, cheerfulness, and applause. These indicators reflect both cognitive engagement and positive emotional involvement during the learning process.

Based on the indicators above, the learning stages that can be implemented with the PAKEM strategy are based on TANDUR. TANDUR is an acronym for Grow, Experience, Name, Demonstrate, Repeat, and Celebrate. Each stage of this approach is implemented with reference to five main principles, namely: (1) providing opportunities for all students to express opinions, (2) each activity has a clear purpose, (3) experience is prioritized before giving terms or names, (4) appreciating the results of student work and effort, and (5) celebrating every achievement that is worthy of learning. The TANDUR approach is considered very effective for implementation in classes with students who tend to be passive, exhibit low learning activity, and lack enthusiasm for participating in the learning process. Based on the facts above, the researcher felt the need to test this strategy on a sample that has weaknesses in conducting data analysis and data processing. Therefore, the effect of child-friendly, Joyful Learning-based data processing materials on the Mathematical analysis skills of sixth-grade students in Madrasah Ibtidaiyah. This study aims to empirically examine whether the implementation of a child-friendly Joyful Learning model can significantly improve students’ mathematical analysis skills in data processing material.

2. METHOD

A research method is an approach used to acquire knowledge or solve problems encountered in a scientific study. This research employed a quantitative method, a systematic approach designed to collect data in a planned manner and present it numerically to answer the research questions. The quantitative approach was chosen to ensure objectivity and to allow statistical testing of the proposed hypotheses.

This research was conducted in the second semester of the 2025/2026 academic year at MIN 4 Medan Barat, located on Jl. Karya Setuju, Sei Agul, West Medan District, Medan City, North Sumatra. The population consisted of sixth-grade students at MIN 4 Medan City. There are three classes: VI-A, VI-B, and VI-C, with a total of 105 students. This setting was selected because it represents a typical elementary madrasah context where students experience difficulties in data processing material.

In this study, the sampling technique used was simple random sampling. Simple random sampling, or simple random sampling, is a sampling technique in which each member of the population has an equal chance of being selected. Selection can be done by lottery or computer. The researcher drew the population using the "Spin the Wheel" application. This application will randomly select classes based on the wheel's stop. After drawing, two classes were selected as the study's sample. The two classes were then selected: Class VI-C, consisting of 35 students, as the experimental class, and Class VI-A, consisting of 35 students, as the control class. This procedure ensured that the sample selection process minimized selection bias and maintained fairness in group assignment.

The study used a quantitative, quasi-experimental research design. In accordance with the problem and objectives of the study, the research design was experimental. Experimental research is intended to determine whether something imposed on the subject of investigation has an effect. In other words, experimental research attempts to examine the existence or absence of a causal relationship. The experimental research uses a quasi-experimental design. Quasi-experimental design research is "a research design that includes a control group but cannot fully control external variables that influence the implementation of the experiment." This design was considered appropriate because the researcher could not randomly assign individual students to different groups due to existing classroom structures.

$$\frac{o_1 \;\; x \; o_2}{o_3 \;\;\;\; o_4}$$

Description:
O1: Pretest for the experimental group
O2: Posttest for the experimental group
O3: Pretest for the control group
O4: Posttest for the control group
X : Implementation of the Joyful Learning learning model
This design allows comparison of students' abilities before and after treatment in both groups to determine the effect of the intervention.

The prerequisite analysis in this study consisted of three stages: normality testing, homogeneity testing, and linearity testing. The prerequisite testing used SPSS version 16.0 software. A normality test was conducted to determine whether the data for the mathematical communication ability variable were normally distributed. If the probability value (p-value) sig> 0.05, the data are normally distributed. These prerequisite tests were conducted to ensure that the data met the assumptions required for parametric statistical analysis.

To obtain data in this study, several data collection techniques were used: (a) a pretest and posttest, each consisting of five essay-style questions, and (b) a 10-question questionnaire to determine students' responses to the implementation of the Joyful Learning learning model. These tests were structured around indicators of mathematical analysis ability and used to measure students' ability levels. Before being used in research, the test instrument was first tested to determine its validity, reliability, discriminatory power, and item difficulty. Conducting instrument validation ensured that the data collected were accurate, consistent, and suitable for measuring the intended constructs.

The research design used in this study was a pretest-posttest control one-group design. In this design, there were two groups: one receiving treatment with the Joyful Learning model and the other using conventional learning methods. The group receiving treatment was called the experimental group (experimental class), and the group receiving no treatment was called the control group (control class). This structure enabled direct comparison between innovative and conventional instructional approaches.

The control group was selected, but not given treatment (conventional), and a posttest was administered at the end of the study. The experimental group was selected, using the Joyful Learning model, and a posttest was administered at the end of the study. By administering both pretests and posttests, the researcher was able to measure the magnitude of learning improvement in each group.

According to Anderson & Krathwohl, analysis involves breaking down material into its constituent parts and determining the relationships among these parts and their connections to the overall structure or purpose. The indicators for measuring analytical skills are: 1. Differentiating: Students can sort out relevant and irrelevant parts; 2. Organizing: Students can create a systematic structure for problem solving, and 3. Attributing: Students can express information in the form of conclusions. These indicators served as the foundation for constructing the assessment items used in this study.

The test administered was a pretest-posttest to measure students' mathematical analytical skills before and after receiving the treatment. The test questions were in essay form. The researcher administered five questions. The instrument was adapted to indicators of mathematical communication skills. After data collection, it was analyzed using descriptive statistics. Prerequisite tests were then conducted using normality and homogeneity tests. Hypothesis testing was then conducted using an Independent Sample T-Test. The Independent Sample T-Test was used to determine whether there was a statistically significant difference between the experimental and control groups after the treatment was implemented.

3. RESULTS AND DISCUSSION

3.1. RESULT

In this study, a pretest and posttest were administered to respondents. The pretest is an initial test administered before the study begins to obtain students' baseline scores, which are used to set the posttest baseline. After administering the pretest to the respondents, the study can be conducted. In the research phase, the two sample classes received different treatments. The experimental class was taught using the Joyful Learning model, while the control class was taught using the learning model provided by the subject teacher. After the treatment was implemented, the sample was given a final test, a posttest. This procedure enabled the researcher to compare students' learning progress before and after the intervention in both groups.

After the pretest and posttest scores were obtained, an analysis was conducted to determine whether there was an increase in scores. To determine the N-gain test, the following formula was used. The N-gain analysis was used to measure the effectiveness of the treatment by calculating the normalized improvement in students' scores.

Table 1. N-gain Test Results for the Experimental and Control Classes

Statistic	Result
N-gain Score Experimental Class	0.84
N-gain Score Control Class	0.35

The N-gain test results above demonstrate a difference in scores between the experimental and control classes. The experimental class obtained an N-gain score of 0.84, while the control class obtained an N-gain score of 0.35. An N-gain score of 0.84 is categorized as high improvement, whereas 0.35 is categorized as moderate improvement, indicating that the experimental class experienced greater learning gains. After obtaining the N-gain scores, they were tested again to determine whether the data were normally distributed using the Lilliefors test. After conducting the normality test, the following results were obtained. The normality test results indicated that the data were normally distributed, as the significance value exceeded 0.05.

$$F_{count} = \frac{Largest\ Variance}{VSmallest\ arians}$$

In this study, the data that will be tested for homogeneity is the data from the n-gain results of students' understanding of mathematical concepts, and the following results are obtained:

Table 2. Results of the N-gain Homogeneity Test with SPSS

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil	Based on Mean	2.886	1	68	.094
	Based on Median	2.500	1	68	.118
	Based on median and with adjusted df	2.500	1	64.316	.119
	Based on trimmed mean	2.830	1	68	.097

From Table 2 above, it can be seen that the significance values are greater than 0.05. This indicates that the variance of the two groups is homogeneous, meaning that the assumption of homogeneity is fulfilled. After testing for data normality and homogeneity, the research data met the assumptions required for parametric testing.

Next, we will conduct a hypothesis test on the n-gain value. In this study, the hypothesis test uses a t-test with a significance level of α = 0.05. Conclusions are drawn from the hypothesis test by comparing the t-count and t-table. If t-count > t-table, Ho is rejected, and Ha is accepted. Conversely, if t-count < t-table, Ho is accepted and Ha is rejected. This procedure was used to determine whether there was a statistically significant difference between the experimental and control groups. The following are the hypotheses in this study:

Table 3. Independent Samples Test Results

Independent Samples Test

t-test for Equality of Means							
t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		One-Sided p	Two-Sided p			Lower	Upper
-12.963	68	<.001	<.001	-5.257	.406	-6.066	-4.448
-12.963	63.798	<.001	<.001	-5.257	.406	-6.067	-4.447

 https://doi.org/10.58421/gehu.v5i1.1137

In accordance with the criteria for concluding hypothesis testing, the results of the table above indicate that Ha is accepted. If t count > t table, then Ho is rejected and Ha is accepted. The absolute value of t-count (12.963) is far greater than the t-table value (1.995), and the significance value is $p < .001$, indicating a highly significant difference between the two groups. This indicates that the joyful learning model affects students' understanding of mathematical concepts.

Based on the research results and data analysis, it can be concluded that implementing the Joyful Learning model significantly improves students' understanding of mathematical concepts. This is demonstrated through a hypothesis test using an Independent Samples T-Test, which showed a t value of 12.963 and a t table value of 1.995, with a significance value of $p < .001$. Ho is rejected, and Ha is accepted. Thus, the joyful learning model is more effective than conventional models at improving students' understanding of mathematical concepts. These findings confirm that the child-friendly Joyful Learning approach provides a substantial positive impact on students' mathematical analytical development compared to traditional instruction.

3.2. DISCUSSION

The findings of this study provide strong empirical evidence that the Joyful Learning model has a significant positive effect on students' understanding of mathematical concepts. This conclusion is supported by the substantial difference in N-gain scores between the experimental class (0.84) and the control class (0.35). The high N-gain score achieved by students in the experimental group indicates a very high level of improvement in conceptual understanding, while the control group showed only moderate improvement. These results suggest that learning environments designed to be engaging, enjoyable, and student-centered can facilitate deeper comprehension of mathematical material compared to conventional instructional approaches that tend to emphasize teacher explanation and procedural practice.

The statistical analysis further strengthens the credibility of these findings. The normality test showed that the data were normally distributed, allowing for parametric testing. Although the homogeneity test indicated differences in variance between the two groups, the data still met the requirements for conducting an Independent Samples T-Test. The hypothesis testing results revealed a t-value of 12.963, which was significantly greater than the t-table value of 1.995 at $\alpha = 0.05$, with a p-value of $< .001$. This indicates that the observed difference in learning gains was not due to chance. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted, confirming that the Joyful Learning model significantly influences students' understanding of mathematical concepts.

The results of this study are consistent with previous research conducted by Suyanto and Jihad, who found that Joyful Learning increases students' motivation and engagement, leading to improved academic achievement, particularly in mathematics. Their study emphasized that positive emotional experiences during learning help students remain focused and reduce anxiety toward mathematical tasks. Similarly, research by Hidayati et al. found that Joyful Learning encourages active student participation and enhances conceptual understanding by allowing students to explore mathematical ideas through interactive, meaningful activities. These findings support the current study’s results, which show higher learning gains among students exposed to Joyful Learning strategies.

In addition, the findings align with Saragih's work, which concluded that students taught using joyful, contextual learning approaches demonstrated better conceptual mastery than those taught using conventional methods. Saragih highlighted that learning models that emphasize enjoyment and interaction help students connect abstract mathematical concepts to real-life situations, making them easier to understand and remember. Furthermore, Rahmawati and Widodo found that Joyful Learning positively affects students’ problem-solving abilities and conceptual clarity, as students are more willing to express ideas, ask questions, and collaborate with peers in a supportive learning atmosphere. These conditions are essential for constructing meaningful mathematical understanding.

Another relevant study by Putra et al. demonstrated that Joyful Learning significantly improves students’ learning outcomes by integrating games, discussions, and collaborative activities into the learning process. Their findings suggest that such approaches enhance students’ cognitive engagement and encourage higher-order thinking skills. This supports the results of the present study, which showed that students in the experimental class had significantly higher N-gain scores than those in the control class. Collectively, these previous studies reinforce the argument that Joyful Learning is not only effective in improving motivation but also plays a crucial role in strengthening students’ conceptual understanding in mathematics.

Overall, the results of this study, supported by both statistical evidence and previous empirical research, indicate that the Joyful Learning model is an effective instructional strategy for improving students’ understanding of mathematical concepts. By fostering a positive emotional climate, encouraging active participation, and promoting meaningful learning experiences, Joyful Learning enables students to achieve higher learning gains than conventional learning models. Therefore, this model can be recommended as an innovative alternative for mathematics teachers seeking to improve students’ conceptual understanding and overall learning outcomes.

4. CONCLUSION

Based on the study's results and the formulated research problems, it can be concluded that the Joyful Learning model has a significant effect on students’ understanding of mathematical concepts. This is reflected in the differences in learning outcomes between students taught using the Joyful Learning model and those taught using conventional methods. The Joyful Learning model creates an engaging, enjoyable learning environment that encourages students to actively participate in the learning process, leading to deeper conceptual understanding. The high N-gain score obtained by the experimental class further strengthens this finding, indicating that students experienced substantial improvement after the implementation of the model. This conclusion is supported by the results of the t-test, which showed that the t-count was 12.963 and the t-table value was 1.995 at a significance level of 0.05. Since t-count > t-table, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_a) was accepted. The significance value of $p < .001$ demonstrates that the difference between the two groups was not due to chance, but rather to the effectiveness of the instructional intervention. These results statistically confirm that the Joyful Learning model significantly influences students' abilities in mathematical analysis and conceptual understanding. From a pedagogical perspective, this finding suggests that integrating emotional engagement with active learning strategies enhances students' cognitive processing and retention of mathematical concepts. Therefore, it can be concluded that the Joyful Learning model is effective in improving students' understanding and analytical skills in mathematics. This model can be considered an alternative instructional approach that supports active, meaningful, and enjoyable learning experiences and is recommended for use in mathematics instruction to enhance students' overall learning outcomes. In addition, the findings imply that teachers who adopt student-centered and emotionally supportive instructional strategies may foster stronger analytical competencies compared to traditional teacher-centered approaches.

REFERENCES

[1] S. Maysarah, S. Saragih, D. Armanto, and H. Siregar, "Kemampuan literasi matematis dan keterampilan sosial melalui model project based learning," *Delta-Pi J. Mat. dan Pendidik. Mat.*, vol. 13, no. 1, pp. 68–81, 2024, doi: 10.33387/dpi.v13i1.7076.

[2] R. Wahyu, Y. Putra, F. G. Putra, and N. W. Putra, "Pengembangan Desain Didaktis Bahan Ajar Materi Pemfaktoran Bentuk Aljabar pada Pembelajaran Matematika SMP," *Numer. J. Mat. dan Pendidik. Mat.*, vol. 1, no. 2, pp. 97–102, 2017.

[3] Y. K. Kartika and F. Rakhmawati, "Peningkatan Kemampuan Berpikir Kritis Matematis Siswa Menggunakan Model Inquiry Learning," *J. Cendekia J. Pendidik. Mat.*, vol. 6, no. 3, pp. 2515–2525, 2022, doi: 10.31004/cendekia.v6i3.1627.

[4] Fauzi Fahmi, Nirwana Anas, Rahmi Wardah Ningsih, Rabiatul Khairiah, and Winarli Hendi Permana, "Pemanfaatan Media Pembelajaran Sederhana Sebagai Sumber Belajar," *Decod. J. Pendidik. Teknol. Inf.*, vol. 1, no. 2, pp. 57–63, 2021, doi: 10.51454/decode.v1i2.17.

[5] D. Hurriyati, M. Rosada, M. M. L. Tama, and M. I. Ramdhani, "Metode Joyfull Learning Dapat Meningkatkan Minat Belajar Matematika Pada Anak Sekolah Dasar.," *SELAPARANG J. Pengabdi. Masy. Berkemajuan*, vol. 6, no. 1, p. 119, 2022, doi: 10.31764/jpmb.v6i1.7205.

[6] A. Ramadhani, Nurhadi, R. Aprilia, and Azainil, "Penerapan Joyful Learning Dalam Upaya Peningkatan Minat dan Hasil Belajar Matematika," *J. Deriv. J. Mat. dan Pendidik. Mat.*, vol. 11, no. 2, pp. 134–146, 2024, doi: 10.31316/jderivat.v10i2.6377.

[7] Nurin Arindyah Putri and Rika Wulandari, "Pengaruh Model Pembelajaran Joyfull Learning Terhadap Kemampuan Numerasi Materi Pecahan Siswa Kelas III SDN Banyuajuh 3," *J. Media Akad.*, vol. 2, no. 2, pp. 2798–2807, 2024, doi: 10.62281/v2i2.188.

[8] M. Syahroni, A. Lestari, L. Nur, and K. Siregar, "Problematika Pembelajaran Matematika Di MTs. Swasta," *ADZKIYYA J. Pendidik. Dasar*, no. 2, pp. 10–18.

[9] H. P. E. Saragih, E. Andhany, and S. S. B. Ginting, "Pengaruh Model Pembelajaran Joyful Learning Terhadap Pemahaman Konsep Matematis Siswa SMP," *Relev. J. Pendidik. Mat.*, vol. 4, p. 2, 2024.

[10] M. M. Harianja and S. Sapri, "Implementasi dan Manfaat Ice Breaking untuk Meningkatkan Minat Belajar Siswa Sekolah Dasar," *J. Basicedu*, vol. 6, no. 1, pp. 1324–1330, 2022, doi: 10.31004/basicedu.v6i1.2298.

[11] A. Rohani, R. R. Wandini, and S. Ritonga, "Pengaruh metode joyfull learning terhadap hasil belajar ilmu pengetahuan sosial peserta didik kelas v sekolah dasar," *MUKADIMAH J. Pendidikan, Sejarah, dan Ilmu-ilmu Sos.*, vol. 5, pp. 208–215, 2021.

[12] A. F. Yustina and Y. Yahfizham, "Game Based Learning Matematika dengan Metode Squid game dan Among us," *J. Cendekia J. Pendidik. Mat.*, vol. 7, no. 1, pp. 615–630, 2023, doi: 10.31004/cendekia.v7i1.1946.

[13] A. I. Permatasari, B. Mulyani, and N. D. Nurhayati, "Efektivitas Penggunaan Model Pembelajaran Joyful Learning Dengan Metode Pemberian Tugas Terhadap Prestasi Belajar Siswa Pada Materi

Pokok Koloid Siswa Kelas XI IPA SMA Negeri 1 Simo Tahun Pelajaran 2012 / 2013," *J. Pendidik. Kim. (JPK), Vol. 3 No. 1 Tahun 2014*, vol. 3, no. 1, pp. 117–122, 2014.

[14] R. U. Hasanah, A. Murni, and P. Yuanita, "Upaya Meningkatkan Motivasi Belajar Matematika Menerapkan Pembelajaran Kooperatif Pendekatan Upaya Meningkatkan Motivasi Belajar Matematika Siswa Kelas X Iis 1 Sman 10 Pekanbaru Dengan Menerapkan Pembelajaran Kooperatif Pendekatan.," vol. 2, no. 1, pp. 1–13, 2014.

[15] Z. Trinova, "Hakikat belajar dan bermain menyenangkan bagi peserta didik," *Al-Ta'lim J.*, pp. 209–215, 2012.

[16] A. Alhakiki and Taufina, "Pengaruh Quantum Teaching Kerangka TANDUR Terhadap Hasil Belajar Matematika Siswa di Sekolah Dasar," *J. Basicedu*, vol. 5, no. 5, pp. 3(2), 524–532, 2020.