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The Influence of Puzzle Picture Assisted Guided Inquiry Learning Model on Learning Outcomes of Natural Sciences

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Abstract: This study aims to analyze the effect of the guided inquiry learning model with the help of a puzzle picture on the learning outcomes of fifth grade elementary school students in the Sudirman cluster, Pulokulon District, on the material of human respiratory organs. This research is a quantitative research with experimental method. The research population was the fifth-grade elementary school students, a group of general Sudirman, Pulokulon District. The sample in the study was the fifth-grade students of Karangharjo State Elementary School as the experimental class with a guided inquiry model with the help of a puzzle picture and the fifth-grade students of Karangharjo Small State Elementary School as the control class with the conventional model. The sampling technique is purpose sampling. Data collection techniques are carried out using tests, observations and documentation. Data analysis was in the form of prerequisite analysis test (normality test and homogeneity test) and hypothesis testing with t-test and Normalized Gain (N-Gain). The results showed that there was an effect of guided inquiry learning model assisted by puzzle picture on student learning outcomes. with the results of t count of 6.154, t table of 2.0277 then t count > t-table.

Keywords: Guided inquiry, puzzle picture, science learning outcomes

1. Introduction

Learning is a form of growth or change in a person which is expressed in behavior from the results of training and experience. Teaching is the activity of giving lessons to students carried out by the teacher. Aspects in learning that need to be taught to students are cognitive (thinking), affective (attitude) and psychomotor (knowledge) aspects. One part of the cognitive aspect, namely the knowledge that needs to be conveyed by the teacher is science knowledge. The importance of science in education is because natural science can enter all aspects of human life from the simplest in everyday life to the complex. But in reality, according to students, science lessons are still difficult, so there needs to be encouragement from the teacher.

Learning outcomes are changes in student behavior that include cognitive, affective and psychomotor fields (Slamet et al., 2021). Learning outcomes are defined as the process of changing behavior in individuals due to the interaction between individuals and their environment (Triyanti, Murtono, & Sri, 2021). A person after experiencing the learning process will experience changes in behavior both aspects of knowledge, aspects of attitudes and aspects of skills. Among the three domains, it is the cognitive domain/aspect that is most assessed by teachers in schools because it relates to the students' ability to master the content of the subject matter.

1.2 Conceptual Framework

The learning process in Indonesia is still mostly teacher centered. The teacher has a lot of activities and students only accept the knowledge conveyed by the teacher. This is not in accordance with the nature of students as learning subjects, the learning carried out must be student centered so that students are actively involved in the learning process, especially in natural science material whose learning object is nature (Ulva, Ibrohim & Sutopo, 2017). Good learning is varied learning that does not use monotonous methods, as a result, students tend to depend on the explanation of the material

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presented by the teacher and students look passive so that learning seems boring. Such problems also occur in fifth grade elementary school students as well as general Sudirman, Pulokulon sub-district.

Teachers in teaching tend to use direct learning models and the process of teaching and learning activities is teacher-centered, while the human respiratory system material is material that requires the ability of students to think logically, but the teacher does not direct so that students are less interested in paying attention to the material presented by the teacher. . This results in low student learning outcomes that are still below the minimum completeness score (KKM), so we need a learning model that can improve learning outcomes (Khotima et al., 2022).

The problems above can be overcome in many ways that can be applied by teachers in teaching that can improve learning outcomes, one of which is guided inquiry learning with the help of a puzzle picture. Hartono (2013:72) argues that the guided inquiry learning model is a learning model in which in practice the teacher provides guidance to students, so that in this model the teacher's role is more dominant than the students.

Puzzle is an educational game tool that serves to train logic, fine motor skills and practice problem solving or problem solving to match the shape of each puzzle piece (Handayani, Zulaikha, & Kristiantari, 2014). According to Anggraeni (2015) puzzle is an educational game media which can stimulate children's abilities by disassembling, assembling and combining several pieces of images into a complete and perfect image form.

The use of the guided inquiry learning model was previously researched by Afriani (2017) entitled Improving Motivation and Learning Outcomes of Microbiology with the Guided Inquiry Learning Model. The results of the research analysis, it can be concluded that learning by using the guided inquiry model is able to increase student learning motivation and consequently also has an impact on student learning mastery.

The use of puzzle media has also been previously studied by Amanah (2018), entitled " Using Puzzle Picture Media to Improve Science Learning Outcomes Human Breathing Devices for Class V Students Semester 1 MI Klumpit, Karanggede District, Boyolali Regency, 2017/2018 Academic Year. The results showed that the average pretest value of the experimental class was 62.93 and the control class's pretest was 59.35, while the posttest average value of the experimental class was 71.38 and the control class's posttest average was 63.39. Learning outcomes data were analyzed using a two-party t-test using the t-test polled variance formula with the test criteria, namely if t-count> t table, then HO is rejected and Ha is accepted, so there is an influence of puzzle media on.

The results of previous studies prove that the guided inquiry learning model and puzzle media can increase learning motivation and learning outcomes. This is because the teacher provides opportunities to learn according to their needs, their creative abilities will grow, through inquiry learning, placing students as subjects in learning so that they learn more independently, develop creativity and seek various alternative solutions to the given learning problems (Amin et al., 2021). In addition, the use of puzzle picture media can be a medium for teachers to raise the spirit of learning for students who are less active and eliminate the impression of being boring in science lessons. Puzzle Picture media in Natural Science (IPA) learning activities can foster a sense of wanting to learn in him and can make a satisfactory assessment of learning outcomes.

1.3 Research Objectives

The research design uses quantitative research. According to Sugiyono (2017:14) quantitative research is defined as research based on the philosophy of positivism, which is used to examine certain populations or samples, sampling techniques are generally carried out randomly, data collection uses research instruments, data analysis is quantitative/statistical with the purpose of testing the established hypothesis. This study aims to determine whether the guided inquiry learning model assisted by puzzle media can improve student learning outcomes in science subjects in grade 5 elementary school material for human respiratory organs. The method used is an experimental method to find the effect of treatment on others under controlled conditions. The design used in this study is a pre-test post-test control group design.

2. Methodology

This type of research uses quantitative research. The research design used in this study was a non-equivalent control group design (pretest-posttest control group design without random). The research subjects were all fifth-grade elementary school students in the Sudirman Cluster, Pulokulon District, Grobogan Regency. The population in this study were all fifth-grade students of the Sudirman Group, Pulokulon District in 2021 totaling 10 elementary schools with a total of 257 students. The sample in this study were two elementary schools, namely class V Public Primary School Number 4 Karangharjo as a Guided Inquiry Learning class assisted by Media Puzzle and class V Public Primary School Karangharjo as the control class. The sampling technique is purposive sampling.

The research variable is the guided inquiry model with the help of the puzzle picture as the independent variable and the fifth-grade students' learning outcomes as the dependent variable. Data collection techniques used are observation and written test. The research instrument was a multiple-choice test with 20 questions. The data analysis includes data description, analysis prerequisite test, and hypothesis testing using t test. and N-gain test.

3. Findings and Discussion

3.1 Data Description

The data obtained in this study consisted of data from the pre-test and post-test results, in the control class and the experimental class. The results of the pre-test are used as data to measure the initial ability to understand concepts (learning outcomes) of students, and the post test results are used to determine the final ability level of students after carrying out learning activities in terms of understanding concepts (learning outcomes) in the control class and experimental class. The data that the researchers described above are attached to each test and will be used to test the research hypotheses that have been formulated previously. The results of the data description analysis are.

Table 1. Pre-Test data analysis

		Pre-test score	
		Control Class	Media Puzzle Assisted Guided Inquiry Class
N	Valid	8	33
Mean		42.50.00	41.06.00
Maximum		53	65
Sum		340	1355

Based on the table of pre-test scores, it shows that the average value of the control class is 42.5, and the guided inquiry class assisted by puzzle media is 41.06. The pre-test values for the control class and the experimental class have almost the same average value so that there is no difference in the abilities of the three classes.

Table 2. Analysis of post test data

		Nilai *Post -Test*	
		Control Class	**Media Puzzle Assisted Guided Inquiry Class**
N	Valid	8	33
Mean		63.50.00	82.48.00
Minimum		59	65
Maximum		71	100
Sum		508	2722

Based on the table of post test scores, it shows that the average score for the control class is 63.5. and the guided inquiry class with the help of puzzle media was 82.48. In the post test scores for the control class and the experimental class there are differences, there is a significant average value with a Minimum Completeness Criterion of 65, so the control class has an average below the Minimum Completeness Criteria and the experimental class an average value above the Minimum Completeness Criteria. Based on the data above, a bar chart can be made for the results of the pre-test and post-test for each class. The diagram of the results of the descriptive analysis are:

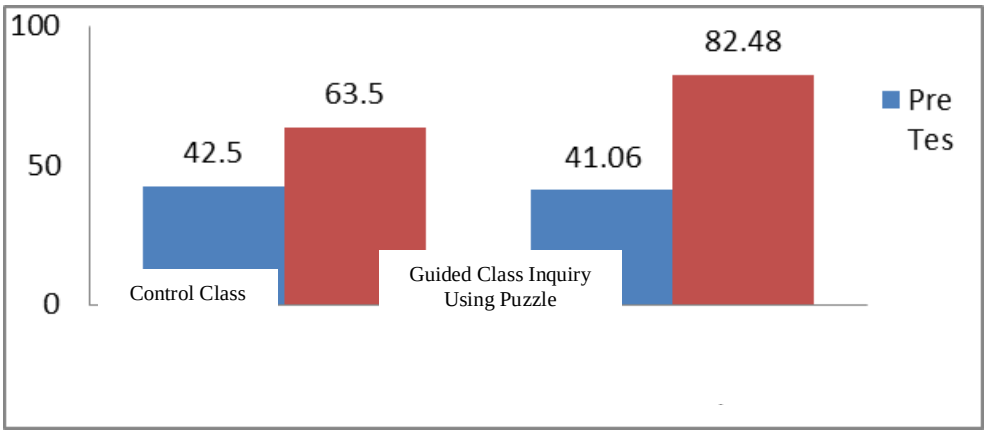

Figure 1. Diagram of pre-test and post-test data analysis results

3.2 Hypothesis Testing

The statistical hypothesis is:

Ho: There is no difference in the learning outcomes of fifth grade students in the material of human respiratory organs using guided inquiry learning model assisted by puzzle picture with conventional learning.

Ha: There are differences in the learning outcomes of fifth grade students in the material of human respiratory organs using the guided inquiry learning model with the help of a puzzle picture with conventional learning.

The results of the t-test for the hypothesis are:

Table 3. Hypothesis t-test. group statistics

Group Statistics

	Class	N	Mean	Std. Deviation	Std. Error Mean
Science Post Test Score	Puzzle-Assisted Guided Inquiry Class	33	82.48	8.412	1.464
	Class Control	8	63.50	4.243	1.500

Table 4. Hypothesis t-test. independent samples test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Science Post Test Score	Equal variances assumed	2.887	.097	6.154	39	.000	18.985	3.085	12.745	25.225
	Equal variances not assumed			9.057	22.274	.000	18.985	2.096	14.641	23.329

Based on the calculations in the t-test table, hypothesis 2 shows: the average value for the two classes there is a difference in the statistical group. The Puzzle Assisted Guided Inquiry class is 82.48, while the control class is 63.50. t count is 6.154 while t table with df = 39 is 2.0277 then t count > t table or 6.154 > 2.0277. Because t count > t table, then H0 is rejected and Ha is accepted. it means that there are differences in the learning outcomes of class V students in the material of human respiratory organs using guided inquiry learning models assisted by puzzle pictures with conventional learning.

3.3 Gain Test

Gain test is the difference between the post-test and pre-test scores. The gain value will indicate whether there is an increase in the learning outcomes of class V students on the human respiratory organ material after the lesson is carried out by the teacher. the implementation of the gain test was carried out in each class, both the control class, and the guided inquiry learning model assisted by the puzzle picture. Gain test is done with the help of SPSS. The results of the Gain test for each class are:

Table 5. N-Gain Test Results for Experiment Class and Control Class

No	Score	Media Assisted Guided Inquiry Class Puzzle	Class Control
1	Mean	69.2598	35.409
4	**N-Gain**	0, 69259	0,354
5	Criteria	High	Low
5	N-Gain %	69.2598	35.409
7	Interpretation	Effective enough	Not effective

Based on these data, the results of the N-gain percent calculation are: in the control class. The N-Gain percent value is 35.4097 which is interpreted to mean that conventional learning models are not effective because they are in the g<40 range. This means that conventional learning models are not effective for improving learning outcomes of human respiratory organs

Media Puzzle Assisted Guided Inquiry class. The percent N-Gain value is 69.2598 which is interpreted to mean that learning the Guided Inquiry Assisted Media Puzzle model is quite effective because it is in the 56-75 range. This means that the Guided Inquiry Assisted Media Puzzle learning model is effective enough to improve learning outcomes of human respiratory organs.

The results of the analysis of the average value of the pre-test and post-test in the guided inquiry class with the help of the picture puzzle and the control class after the test, there was a difference in the average value. the pre-test value was 41.06. and the posttest value of 82.48. Guided inquiry learning with the help of picture puzzles increased the average result. this is because of the application of guided inquiry learning and the use of puzzle picture media. This is because in guided inquiry learning activities the teacher provides opportunities to learn according to their needs, then their creative abilities will grow, through inquiry learning, placing students as subjects in learning so that they learn more independently, develop creativity and seek various alternative solutions to learning problems. which is given. In addition, the use of puzzle pictures will facilitate students' understanding of the material presented and improve student learning outcomes. about breathing Because through the puzzle picture abstract things can be made concrete, and complex things can be simplified (Handayani, Utaminingsih & Utomo, 2020).

The ease with which students understand the material using the guided inquiry model with the help of a picture puzzle is strengthened by the results of the t test. The t-count value is 6.154 while the t-table is 2.0277, so t-count > t-table (6,154 >2.0277. It means that there are differences in the learning outcomes of fifth grade students on the human respiratory organ material using the guided inquiry learning model with the help of picture puzzles with conventional learning.

In guided inquiry with the help of a puzzle picture, learning activities must be managed properly by the teacher and learning activities must be predicted from the start (having a plan). This type of inquiry is suitable to be applied in learning about basic concepts in certain fields of science (Afnidar, 2015:11). Puzzle is a classic game. It's not native to Indonesia. At first, puzzles were imported products. Puzzles can actually help children learn to solve problems. By trying several ways of pairing pieces of pictures, students are trained to think creatively. Puzzle games also hone children's perseverance, in solving problems, of course (Tambun, 2014).

According to Al-Azizy (2010:78), the benefits of this game are as follows: 1) Sharpen the brain. Puzzles are a great way to train your little one's brain, train nerve cells, and solve problems. 2) Train eye and hand coordination. Puzzles can train children's hand-eye coordination. They have to match the pieces of the puzzle and arrange them into one picture. These games help children recognize shapes and are an important step towards developing reading skills. 3) Train reason. Puzzles in human form will train their reasoning. They will conclude where the head, hands, feet, etc. are located according to logic. 4) Practice patience. Puzzles can also train children's patience in completing a challenge. 5) Knowledge.

The results of this study are in accordance with the results of Suciaty's research and opinion, namely Amanah (2018) research, entitled " Using Puzzle Picture Media to Improve Science Learning Outcomes Human Breathing Devices for Class V Students Semester 1 MI Klumpit, Karanggede District, Boyolali Regency, 2017/2018 Academic Year. The results showed that the average pretest value of the experimental class was 62.93 and the control class's pretest was 59.35, while the posttest average value of the experimental class was 71.38 and the control class's posttest average was 63.39. Learning outcomes data were analyzed, there was an influence of puzzle media on social studies learning outcomes for third grade students at MI Klumpit, Karanggede District, Boyolali Regency, 2017/2018.

According to Hastuti (2017) in a study entitled "The Effect of Puzzle Media on Science Learning Outcomes the Concept of Life Cycle of Living Things Students of Grade IV Elementary School 25 Panaikang, Bisappu District, Bantaeng Regency. The results showed that there was an increase in learning outcomes after being given treatment. So, it can be concluded that the use of puzzle media has a significant influence on student learning outcomes in science subjects.

Based on the results of this study also reinforced by Nisak (2011:110), this puzzle game has the following objectives: a) forming a spirit of cooperation in the participants, because this game will be done in groups; b) participants can be more consistent with what is being done; c) train participants' logical mathematical intelligence; d) foster a sense of solidarity among students; e) foster a sense of kinship between students; f) train strategies in cooperation between students; g) foster mutual respect and appreciation among students; h) foster a sense of belonging among students; i) entertain the students in the class.

The results of the N-Gain test in the guided inquiry experimental class with the help of a puzzle picture were 69.2598 which was interpreted as quite effective, meaning that the guided inquiry learning model with the help of a puzzle picture was quite effective in improving the learning outcomes of human respiratory organs.

The results of the study stated that guided inquiry assisted by puzzle pictures was quite effective in improving student learning outcomes because guided inquiry was an effective way to create variations in the atmosphere of classroom learning patterns. Kuhlthau & Todd (2007), see that the use of guided inquiry in science learning is very

appropriate. Students are guided by teachers in building knowledge and understanding of science objects and problems, conducting independent learning including conducting independent investigations.

In the guided inquiry learning process, it is attempted so that students gain their own experience and knowledge, carry out scientific investigations, train their intellectual abilities, and stimulate curiosity and can motivate their ability to improve their newly acquired knowledge. By developing process skills, children will be able to find and develop their own facts and concepts as well as grow and develop the attitudes and values required (Zulfah, Utaminingsih, & Bintoro, 2018). Guided inquiry is assisted by a picture puzzle, so in the learning process using picture puzzle media can easily arouse and stimulate students to be active in the learning process and do not reduce the main meaning of learning, but instead help clarify it (Sumaryati, Rahayu, & Utaminingsih, 2018).

Learning by using picture puzzle media will also give different nuances in the learning process, because in addition to students being active in learning, picture puzzle media can increase students' creativity to arrange the pieces of the picture into a complete picture. It can also improve students' memory of the material because students try to compose it with their own abilities (Utaminingsih, Utomo, & Zamroni, 2017). The advantage of this picture puzzle media lies in the pieces of the picture that must be arranged correctly and become a complete picture so that students must be careful in arranging them so that they can easily understand the content of the material presented using the picture puzzle.

4. Conclusions and Recommendations

Results Based on the research and discussion, it can be said that there is an influence of the guided inquiry learning model with the help of picture puzzles on the learning outcomes of fifth graders of Primary School Segugus General Sudirman, Pulokulon District, on the material of human respiratory organs. based on the results of t count of 6.154, t table of 2.0277 then t count > t table. This is because guided inquiry is able to make learning more meaningful, because it includes three aspects, namely cognitive, affective, and psychomotor experiencing balanced development. and students. With the help of picture puzzle media which is an educational game and a combination of picture pieces that can help develop students' creative thinking and picture puzzles can increase concentration, interest and develop intelligence

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Conflict of Interest

The authors declare no conflicts of interest.

References

Afnidar, A. (2015). Pengaruh Strategi Pembelajaran Inkuiri Dan Kepercayaan Diri Terhadap Keterampilan Proses Sains Biologi Siswa Pada Topik Pencemaran Lingkungan Di SMA Negeri 1 Mutiara Pidie. [The Influence of Inquiry Learning Strategies and Confidence on Students' Biological Science Process Skills on the Topic of Environmental Pollution at SMA Negeri 1 Mutiara Pidie]. *Jurnal Edukasi dan Sains Biologi*, *4*(1), 76740.

Afriani, D. T. (2017). Peningkatan Motivasi dan Hasil Belajar Mikrobiologi dengan Model Pembelajaran Inkuiri Terbimbing. [Increasing Motivation and Learning Outcomes of Microbiology with Guided Inquiry Learning Model]. Academia.

Al-Azizy, A. S. (2010). Ragam Latihan Khusus Asah Ketajaman Otak Anak Plus Melejitkan Daya Ingatnya. [Variety of Special Exercises to Sharpen Children's Brain Sharpness Plus Boost Their Memory]. Jogjakarta: Diva Press.

Amanah, D. (2018). *Penggunaan Media Puzzle Picture Untuk Meningkatkan Hasil Belajar Ipa Materi Alat Pernapasan Manusia Pada Siswa Kelas V Semester 1 MI Klumpit Kecamatan Karanggede Kabupaten Boyolali Tahun Pelajaran 2017/2018*. [Using Puzzle Picture Media to Improve Science Learning Outcomes Human Breathing Devices for Class V Students Semester 1 MI Klumpit, Karanggede District, Boyolali Regency, 2017/2018 Academic Year]. (Doctoral dissertation, IAIN SALATIGA).

Amin, S., Murtono, Madjdi, A. H., Ardianti, S. D., & Gung, Y. T. (2021). The Effect of Discovery Learning on Science Learning Achievements for Elementary School Students. *Asian Pendidikan*, *1*(2), 54-58. https://doi.org/10.53797/aspen.v1i2.9.2021

Anggraeni, H. A. (2015). *Peningkatan Prestasi Belajar Ipa Materi Alat Pencernaan Manusia Dengan Menggunakan Puzzle Pada Siswa Kelas V Sd N 2 Urutsewu Kec. Ampel Kab. Boyolali Tahun Ajaran 2014/2015*. [Improving Science Learning Achievement in Human Digestive Materials Using Puzzles for Class V Sd N 2 Urutsewu Kec. Ampel Kab. Boyolali 2014/2015 Academic Year]. (Doctoral dissertation, IAIN Salatiga).

Handayani, N. L. P. A., Zulaikha, S., & Kristiantari, M. R. (2014). Pengaruh Penerapan Pendekatan Science, Environment, Technology, And Society (Sets) Melalui Kerja Kelompok Berbasis Lingkungan Terhadap Hasil Belajar Ipa Siswa Kelas V Sd N 9 Sesetan, Denpasar. [The Influence of the Application of Science, Environment, Technology, And Society (Sets) Approaches Through Environment-Based Group Work on Science Learning Outcomes of Class V Elementary School 9 Sesetan, Denpasar]. *MIMBAR PGSD Undiksha*, *2*(1).

Handayani, U., Utaminingsih, S., & Utomo, S. (2020). Soft Skills Model Based School Culture to Development Student Character for Elementary School Students. *Refleksi Edukatika*, 11(1), 1-17.

Hartono, R. (2013). *Ragam model mengajar yang mudah diterima murid*. [Various teaching models that are easy for students to accept]. Diva Press.

Hastuti, W. (2017). *Pengaruh Media Puzzle Terhadap Hasil Belajar Ipa Konsep Daur Hidup Makhluk Hidup Murid Kelas IV SDN Nomor 25 Panaikang Kecamatan Bisappu Kabupaten Bantaeng* [The Effect of Puzzle Media on Science Learning Outcomes the Concept of Life Cycle of Living Things Students of Grade IV SDN Number 25 Panaikang, Bisappu District, Bantaeng Regency]. (Doctoral dissertation, Muhammadiyah University Makassar).

Khotima, D. A., Su'ad, Santoso, & Pratama, H. (2022). The Effectiveness of Android-Based Science Learning Model to Increase Student Learning Outcomes. *Asian Pendidikan*, *2*(1), 33-41. https://doi.org/10.53797/aspen.v2i1.5.2022

Kuhlthau & Todd. (2007). Guided Inquiry: A framework for learning through school librariesin 21st century schools. New Jersey: CISSL.

Nisak, R. (2011). Lebih Dari 50 Game Kreatif Untuk Aktivitas Belajar-Mengajar. [More Than 50 Creative Games for Teaching-Learning Activities]. Jogjakarta: Diva Press.

Slamet, Suad, Madjdi, A. H., Arsyad Fardani, & Gung, Y. T. (2021). The Effect of Discovery Model on The Science Learning Outcomes of Class V Elementary School Students in The Wijayakusuma Cluster. *Asian Pendidikan*, *1*(2), 47-53. https://doi.org/10.53797/aspen.v1i2.8.2021

Sugiyono, P. (2017). Business Research Methods: Quantitative, Qualitative, Combination, and R&D Approaches.

Sumaryati, I., Rahayu, R., & Utaminingsih, S. (2018). Peningkatan Kemampuan Pemahaman Konsep Matematika Siswa SD melalui Model Guided Discovery Learning Berbantuan Permainan Kaki Bima. [Improving the Ability to Understand Mathematics Concepts of Elementary School Students through Guided Discovery Learning Models Assisted by the Bima Foot Game]. *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, *1*(1), 59-66.

Tambun, R. A. (2014, May). The Influence of Using Crossword Puzzle Towards the Students' Vocabulary Mastery. In *International Conference on Education and Language (ICEL)* (Vol. 2).

Triyanti, Murtono, & Sri, U. (2021). Problem Based Technology and Science Development to Improve Science Learning Outcomes in Elementary Schools. *ANP Journal of Social Science and Humanities*, *2*(2), 151-156. https://doi.org/10.53797/anp.jssh.v2i2.21.2021

Utaminingsih, S., Utomo, S., & Zamroni, E. (2017). Strengthening of Indonesian Islamic Character Though Islamic Education Management Based of Soft Skills. *Addin*, *11*(1), 215-242.

Ulva, V., Ibrohim, I., & Sutopo, S. (2017). Mengembangkan Sikap Ilmiah Siswa SMP Melalui Pembelajaran Inkuiri Terbimbing Pada Materi Ekosistem. [Developing Scientific Attitudes of Junior High School Students Through Guided Inquiry Learning on Ecosystem Materials]. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, *2*(5), 622-626.

Zulfah, U., Utaminingsih, S., & Bintoro, H. S. (2018). Penerapan Model Inquiry Berbantuan Media Manipulatif untuk Meningkatkan Kemampuan Koneksi Matematik Siswa SD. [Application of the Inquiry Model Assisted by Manipulative Media to Improve the Mathematical Connection Ability of Elementary School Students]. *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, *1*(1), 42-50.