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IMPLEMENTATIONPROJECT-BASED LEARNING WITH STEM APPROACH TO IMPROVE STUDENTS' CREATIVE THINKING ON WATER CONSERVATION MATERIALS

Yustinus Kus Sukma Aji [1] , Mohamad Zaenal Arifin Anis [2] , Deasy Arisanty[3]

[1]*SMAN 3 Banjarbaru, Indonesia*
[2]*Universitas Lambung Mangkurat, Indonesia*
[3]*Universitas Lambung Mangkurat, Indonesia*

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A B S T R A C T
This study aims to analyze the effect of project-based learning with a STEM approachto increase students' creative thinking about water conservation material. The research design used in this study was a quasi-experimental design and used the non-equivalent pretest-posttest control group design. The research sample consisted of 72 students consisting of 1 experimental class and 1 control class, each class totaling 36 students at SMA Negeri 3 Banjarbaru. The results showed that project-based learning with a STEM approach on water conservation had a major effect on increasing students' creative thinking. The student's average count result is 39.3 with a figure of 78.7% or is included in the high criteria. There is a significant influence on students' thinking before and after implementing project-based learning with a STEM approach on water conservation. The results of the t test gave a significance value of 0.000 ($p < 0.05$) and the results of the different gain test (increase) in the experimental group showed the mean was 0.41 and the control group was 0.05 with a value of 0.000 ($p < 0.05$). Based on the research results, teachers at SMA Negeri 3 Banjarbaru are expected to be able to apply a project-based learning model with a STEM approach to improve students' creative thinking skills for other subjects. This research can be used as a reference for further similar research as initial research data related to project-based learning with a STEM approach on other materials. Based on the research results, teachers at SMA Negeri 3 Banjarbaru are expected to be able to apply a project-based learning model with a STEM approach to improve students' creative thinking skills for other subjects. This research can be used as a reference for further similar research as initial research data related to project-based

[1] Corresponding author.
E-mail addresses: ajismaga79@gmail.com

PRELIMINARY

Chapter 21 requires a strategy to face the challenges of an increasingly complex world today, especially schools and universities as educational institutions must be able to produce quality generations who are able to adapt to the challenges of the 21st century. One of the priorities of the current education system in Indonesia, apart from cognitive skills, is create a generation that is able to think creatively. Creative thinking is essentially the ability to think that begins with sensitivity to the current situation, that in this situation it is possible to see or identify a problem that needs to be solved.(Sabandar, 2017).

Improving the quality of education in Indonesiacan be developed through the implementation of education reform. Changes that occur in the traditional way of learning towards learning that further enhances critical thinking is known as education reform(Irma et al. 2016). One form of educational reform that can be achieved by using a learning approach that can help teachers create professionals is the STEM approach in Science, Technology, Engineering, and Mathematics. STEM is a learning approach that combines two or more disciplines contained in STEM that uses science, technology, engineering, and mathematics in real-world contexts to connect schools, the world of work, and the world globally to develop STEM literacy that will enable students to compete in the new economic era (Sanders & Tsuros, 2009).

In contextIn Indonesia, STEM is an essential issue in the current educational trend, even STEM is a new thing introduced to the world of education in Indonesia. STEM has been implemented in several countries such as the United States, United Kingdom and Japan(Gonzalez & Kuenzi, 2012).The idea of integrating STEM into the school curriculum is an effort to increase or encourage student interest and involvement in the STEM field. One way is to introduce and familiarize yourself with field skills in the STEM field through the integration of STEM education into the primary and secondary education curriculum.(Syukri et al. 2013).

The learning process carried out at SMA Negeri 3 Banjarbaru in classroom learning has used a scientific approach but its implementation is more often in the science cluster subjects, while in social studies subjects more use the lecture method in delivering material, including geography lessons on water conservation material. This lecture method is only centered on the teacher as a source of information orally to students. Activities that occur only in one direction

and only transfer of information occurs even teachers tend to dominate the teaching and learning process activities in the classroom so that there is no reciprocal relationship. Thus students only tend to listen to what is conveyed by the teacher. As a result, it raises problems including 1) In general, the creativity of SMAN 3 Banjarbaru students is still relatively low, it can be seen from the daily test scores and assignments that have not been maximized from the minimum completeness criteria (KKM) in terms of this material is very good for students and as a provision in overcoming problems related to The issue of water conservation in South Kalimantan is mainly related to liquid waste or household waste that has not been resolved based on the results of the discussion on the geography of the Banjarbaru MGMP. 2) The STEM approach has also never been applied in this school and in South Kalimantan in general, especially the application and mastery of concepts in the geography subject of water conservation material.

Learning research related to the STEM approach has been done before, such as:Sumarni et al. (2019)in the title "Cognitive abilities and creative thinking of students through project-based learning with a STEM approach". Place the difference with researchSumarni et al. (2019)is to use a case study focused on cognitive improvement and only one class as a sample subject. This is in line with the opinionWidiastuti & Indriana (2019)in a study entitled "Analysis of the application of the STEM approach to overcome the low creative thinking ability of students on opportunity material". Place the difference with researchWidiastuti & Indriana (2019)is the research method used is descriptive qualitative. The title of the research is "implementation of the Stem approach (Science, Technology, Engineering and Mathematics) to improve critical thinking skills of elementary school students"(Sukmana, 2018). Place the difference with researchSukmana (2018)is on the critical thinking variable for elementary school level.

Previous research was also conducted byKhoiriyah & Wahyudi (2019)entitled "Implementation of the STEM learning approach to improve critical thinking skills of high school students on sound wave material". Place the difference with researchKhoiriyah & Wahyudi (2019)is to focus on critical thinking variables in science subjects. Research title "Stem-based learning to improve understanding of energy concepts and creative thinking skills through the MHP project"(Deti, 2020). Place the difference with researchDeti (2020)is on the subject of research for elementary school students with a research sample of one class.

A study must have differences with other research both from the variables, the number of variables, the place of research, the time of the study, the research sample and so on, the thing that distinguishes this assessment from relevant research is the first, seen from the

learning model used, namely the model project-based learning with a STEM approach, both in terms of variables focusing on creative thinking variables on water conservation materials. In terms of reference to the problem, this research will reveal whether there is an influence between project-based learning and the STEM approach to improve students' creative thinking on water conservation material.

Based ondata, the learning process still uses the lecture method, the STEM approach has never been applied, student creativity is still relatively low, this can be seen from the results of tests and assignments this if ignored will have a major impact on the education process and system in Indonesia. The solution to this problem is to conduct research related to project-based learning, STEM approaches, and creativity.

RESEARCH METHODS

This type of research uses the approachquantitative because it provides answers to the problem paradigm that includes elements of cause and effect. The research design used in this study was a quasi-experimental design and used the non-equivalent pretest-posttest control group design.

O1 ---------X1 ---------O2
O3 -------- X2 --------- O4

O1 is the value of*Pretest*in the experimental class before being given treatment. X1 has accepted the STEM learning approach. O2 is the post-test value in the experimental class. O3 is the pre-test value in the control class. X2 which is not handled with a STEM learning approach. O4 Post-test scores in the control class.

The population of this studyincludes all students of class X IPS SMA Negeri 3 Banjarbaru which consists of 5 classes with a total of 175 students in the 2020/2021 school year. This is in accordance with the view of Sugiyono (2015), according to him the population is the entire range consisting of: objects/subjects with certain qualities and characteristics identified by researchers to be studied, researched, and then drawn conclusions. The sample for this study consisted of two classes, namely the experimental class X IPS 4 and the control class X IIS 5, each class consisted of 36 students. The sampling technique used in this study is simple random sampling, ie simple random sampling.

This study proposes two hypotheses. (1) It is suspected that there is an effect of project-based learning with a STEM approach on increasing students' creative thinking on the

subject of water conservation. (2) It is suspected that there is an influence on the creative thinking of SMA Negeri 3 Banjarbaru students before and after the implementation of project-based learning with a STEM approach for the subject of water conservation.

Data collection techniques usedare tests, observations, documentation and questionnaires. The test for this research is a written test which is used in pre-test and post-test. The form of the description test is used to analyze student responses to problem solving. Observation is a way of collecting data by observing directly and systematically recording the object being studied (Cresswell in Sugiyono, 2016). Observation activities carried out in the study included observing and documenting learning while implementing integrated project-based learning in STEM. This research material is in the form of photos of research implementation activities from the beginning to the end of the learning process. Documentary studies are used to complement the technique of collecting tests and observations (Sugiyono, 2015). Questionnaires were used to respond to student responses about project-based learning, STEM, and creative thinking variables. The data analysis techniques in this study are as follows: (1) N-Gain test to analyze the learning outcomes of Pre-test and Post-test scores; (2) Prerequisite Test consists of validity, reliability, normality, and homogeneity tests; (3) Hypothesis testing with independent sample T-test and paired sample T-test.

RESEARCH RESULTS AND DISCUSSION

Before the research was carried out, the first step was to test the initial ability of the research subjects with a pre-test in order to obtain initial data and then test the balance of the sample used for research. Before testing the hypothesis, it is necessary to test first. The following is a summary of the prerequisite tests for the data before and after being given treatment, which shows that the data meets the prerequisites for the analysis.

Table 1.

Summary of pre- and post-treatment data prerequisite test results

Data	Decision
Pre-test	Same initial ability

Analysis prerequisite

Group	Experiment		Control	
	p value	Information	p value	Information
Pretest	0.199	Normal	0.200	Normal
Posttest	0.200	Normal	0.071	Normal

Source :Yustinus Kus Sukma Aji (2021)

Data analysis for the test criteria is if the significance value in the Kolmogorov-Smirnov test is more than 5% (p> 0.05), then H1 is accepted, meaning that the sample comes from a normally distributed population.

Hypothesis testing

Testing to improve students' creative thinking skills after carrying out project-based learning with the STEM approach using paired sample t-tests (paired t-test), while testing the hypothesis of differences in students' creative thinking abilities for the experimental group, namely class X IPS 4 and control group X IPS 5 using the test. free sample t (independent sample t test). After processing the data, the display of the average difference test output for the experimental class before and after the test can be seen in the table.

Table 4.6. The difference test in the pretest and posttest mean of the experimental class

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest Eksperimen	64,53	36	7,733	1,289
	Postest Eksperimen	79,50	36	4,837	,806

Source: Yustinus Kus Sukma Aji (2021)

In descriptive statistics from 36 experimental class samples studied for the pretest score, the average learning outcome (mean) of 64.53 posttest was 79.50. The value of the standard deviation (std.Deviation) for the pretest was 7,732 and the posttest was 4,837. Std value. Mean error in the pretest is 1,289 and the posttest is 0.806, so the mean value (Mean) of the experimental class difference test is better than the control class.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest Eksperimen - Postest Eksperimen	-14,972	5,930	,988	-16,979	-12,966	-15,148	35	,000

Source: Yustinus Kus Sukma Aji (2021)

In the Paired Samples Test table, the average difference between the post-test and pre-test results is 79.500 - 64.5278 = 14.972. The value of the standard deviation (std.Deviation) is 5.930 with the value of Std. Error Mean 0.988, the difference is between -16.966 to -12.966 (95% Confidence Interval of the Difference lower and upper). The t table value is 15,148, the

df value is 35 with a sig value. (2-tailed) of 0.000. The results of the mean difference test in the experimental class obtained a significant value (sig) of 0.000.

In the pre-test and post-test mean difference test for the control class. After processing the data, the output is obtained in table 4.7.

Table 4.7. The difference test for the mean of the pre-test and post-test of the control class

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest Kontrol	61,19	36	7,686	1,281
	Postest Kontrol	63,03	36	7,905	1,317

Source: Yustinus Kus Sukma Aji (2021)

The statistical results described above, with 36 samples of the control class studied, for the pretest score obtained an average learning outcome (mean) of 61.19, posttest 63.03. The value of the standard deviation (std.Deviation) on the pre-ttes 7,686 and post-ttes 7,905. Std value. Error Mean for pre-ttes 1.281 and for post-ttes 1.317. From the data above, it can be seen that the results of the control class difference test mean (Mean) did not change much.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest Kontrol - Postest Kontrol	-1,833	2,184	,364	-2,572	-1,094	-5,036	35	,000

Source: Yustinus Kus Sukma Aji (2021)

Based on the presentation of the Paired Samples Test, the difference in the mean (Mean) of the post-test and pre-ttes learning outcomes or 63.03 - 61.19 = 1.833. The standard deviation value (std. Deviation) is 2.184 with the value of Std. Error Mean 0.364 the difference is between -2.572 to -1.094 (95% Confidence Interval of the Difference lower and upper). The value of t table is -5,036. The df value is 35 with a sig value. (2-tailed) of 0.000. The results of the different pre-test and post-test control class obtained a significance (sig) of 0.000.

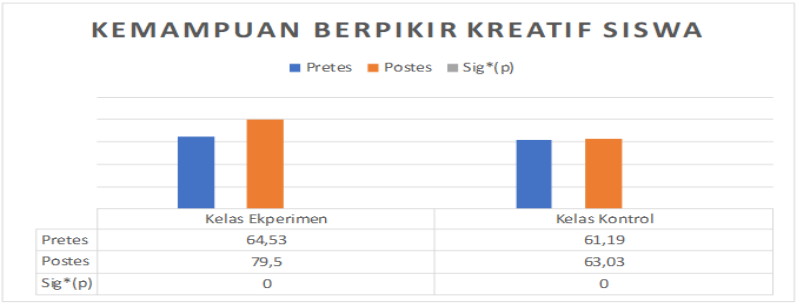
The results of the different post-ttest and pre-ttest using paired sample t-test for the experimental and control groups can be concluded as shown in the table and bar graph.

Table 4.8. The results of the different post-ttest and pre-ttest data on student test results

Variable	mean		Different Test	
	Pretest	Postes	Sig* (p)	Note:
Experiment Class				
Students' creative thinking ability	64.53	79.50	0.000	Significant
Control Class				
	61.19	63.03	0.000	Significant

Source : Yustinus Kus Sukma Aji (2021)

Figure 4.3 The results of the different post-ttest and pre-ttest data on student test results



Source: Yustinus Kus Sukma Aji (2021)

Based on the tables and bar graphs, it is known that for the variable student learning outcomes, the t-test results in the experimental class obtained a pre-ttest value of 64.53 and a post-ttest value of 79.50. In the control class the score before the test was 61.19 and after the test was 63.03, both classes from the results of the arithmetic output showed a significance value of 0.000 (p <0.05), which means that there are differences in students' creative thinking abilities before and after using learning-based learning. project with a STEM approach in the experimental class.

Student Response Analysis

The results of the analysis of student responses can be seen in the following table and bar chart.

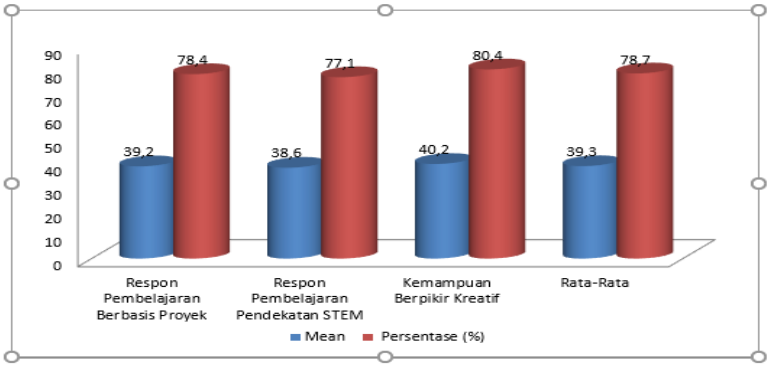
Table 4.17. Student response results

Response	mean	Percentage	Criteria
Response to project-based learning	39.2	78.4%	Tall
Response to STEM Approach Learning	38.6	77.1%	Tall
Students' creative thinking ability	40.2	80.4%	Tall
Average	39.3	78.7%	Tall

Source :Yustinus Kus Sukma Aji (2021)

The results of the conclusions of student responses in the bar graph are as follows.

Figure 4.6 Bar graph of student response results



Source : Yustinus Kus Sukma Aji (2021)

Based on datapresented from tables and bar graphs, it can be illustrated that the results of the calculation of the response rate of students in class X IPS 4 on project-based learning are 39.2 with a value of 78.4% with high information. The learning response with the STEM approach is known to be 38.6 with a percentage of 77.1% with high information. Student response to learning to think creatively is known to be 40.2 with a high percentage of information at 80.4%. The student's average count result is 39.3 with a figure of 78.7% or is included in the high criteria. That is, the students of class X IPS 4 as the experimental class responded positively to project-based learning with a STEM approach to improve students' creative thinking skills.

Project-based learning is a learning model that provides opportunities for teachers to carry out classroom learning by including project work. Through project work learning, students' creativity and motivation can be increased. This method can be seen as a form of open-ended contextual activity-based learning, and is part of the learning process that emphasizes problem solving as a collaborative learning effort that is carried out within a certain period of time.(Wena, 2014).

In this study, project-based learning was carried out, namely creating a water filtration device in groups. Water filtration is one of the concepts in water conservation material for basic competence (KD) 3.7 to analyze the dynamics of the hydrosphere and its impact on life. A water filter is one of the solutions needed to solve the problem of water pollution in South Kalimantan in general.

In this study, each group was able to express their ideas including science and the shape of its products, its technology through the components of the materials used as filtering tools, engineering related to the order in which the materials used and how they worked,

mathematics related to the volume capacity of the tool. the resulting product, as shown in the example of group 3 work below.

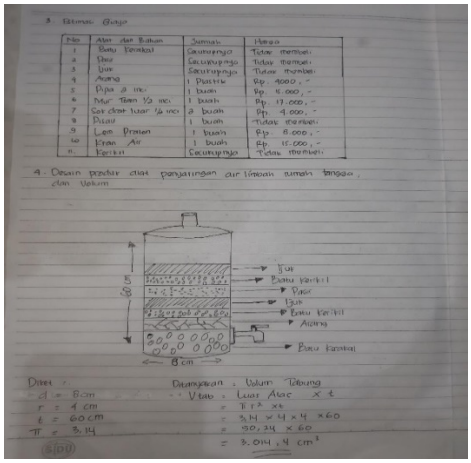


Figure 4.7 LKPD and examples of student projects for wastewater filtration equipment

STEMTo Improve Students' Creative Thinking

Applying the STEM approach encourages students to understand every STEM component of the learning process, including geography to solve environmental problems. Applying STEM measures to solve environmental problems related to environmental pollution is called creative action. This activity will encourage students to be more creative. Creative people often don't talk much in their actions, what they believe they will immediately implement(Munandar, 2009).

In this research cananalyzed that project-based learning with a STEM approach to improve students' creative thinking on the subject of water conservation can facilitate students in SMA Negeri 3 Banjarbaru in the learning process to improve students' creative thinking skills effectively. This is in accordance with the opinionWidiastuti & Indriana (2019)in a study entitled "Analysis of the application of the STEM approach to overcome the low creative thinking ability of students on opportunity material shows that the STEM approach can overcome the weak level of creative thinking skills".

Student responses to project-based learning with the STEM approach were assessed using a questionnaire (questionnaire). Questionnaires were used to determine whether the student's response to the learning method was interesting and practical for students to learn.

The calculated response for project-based learning is 39.2 with a percentage of 78.4% with a high description. The learning response with the STEM approach is known to be 38.6 with a percentage of 77.1% with high information. Student responses to creative thinking skills are known to be 40.2 with a percentage of 80.4% with high information. The student's average count result is 39.3 with a figure of 78.7% or is included in the high criteria. It can be

interpreted, students respond positively to project-based learning with a STEM approach to improve students' creative thinking skills.

Based on the results of research canit was concluded that the students who answered the average were 39.3 with a value of 78.7% or included in the high criteria so that the response was very good. Using project-based teaching materials that are integrated with STEM is one solution to improve students' creative thinking skills. This study shows that the application of STEM-PjBL is very suitable to improve students' understanding of concepts. The average performance in good analytical, computational and evaluative skills is also inseparable from the ability to explain concepts very well.

Based on the results of research thatobtained, they show that every aspect of STEM helps students acquire creative thinking knowledge and skills. Each of these aspects helps students solve problems much more fully when they are integrated. Learning with the STEM approach directly trains students so that students can integrate every aspect synergistically to form a deeper understanding of the subject matter being studied.

In the variable of student learning outcomes, the results of the t-test showed a significance value of 0.000 ($p<0.05$), which means that there are differences in students' creative thinking abilities before and after implementing project-based learning with the STEM approach in class X Social Sciences 4 as the experimental class. In the different test the gain score (increase) of student learning outcomes in the experimental group and the control group obtained a significant value of 0.000 ($p <0.05$). It can be said that there is a significant difference between increasing students' creative thinking skills in the experimental group and the control group. The increase in the experimental group (0.41) was greater than in the control group (0.05).

CONCLUSION

The results of the study after the application of project-based learning with a STEM approach on water conservation materials were very influential in improving students' creative thinking. The calculation of the average student response is known to be 39.3 with a percentage of 78.7% or is included in the criteria. There is a significant influence on students' thinking before and after implementing project-based learning with a STEM approach on the subject of

water conservation. The results of the t-test showed a significance value of 0.000 ($p<0.05$) and the results of the different test gain scores (increase) in the experimental group showed a mean of 0.41 and the control group was 0.05 and a significance value of 0.000 ($p <0.05$).

DAFTAR PUSTAKA

Aji, Y.K.S.,(2021). Pengaruh Pembelajaran Berbasis Proyek dengan Pendekatan STEM Untuk Meningkatkan Berpikir Kreatif Siswa Pada Materi Konservasi. Tesis, Program Studi Magister Pendidikan Ilmu Pengetahuan Sosial, Program Pascasarjana Universitas Lambung Mangkurat.

Ariani, F. N. (2020). Partisipasi Warga Negara (Civic Engagement) Dalam Barisan Pemadam Kebakaran Di Kota Banjarmasin. *JURNAL SOCIUS*, *9*(2), 134–143.

Azharotunnafi, A. (2020). Penanaman Karakter Berbasis Nilai Keagamaan Dalam Mata Pelajaran Ilmu Pengetahuan Sosial. *JURNAL SOCIUS*, *9*(2), 115–122.

Creswell. JW (2012). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Edition 4. Quoted by Sugiyono (2016) in a book entitled "Easy Ways to Compile: Thesis, Thesis and Dissertation". Bandung : Alphabeta.

Blessing, LTM, & Chakrabarti, A. (2009). DRM, A design research methodology. London: Springer.

Deti, AH (2020). https://jurnal.unigal.ac.id/index.php/jwp STEM-Based Learning to Improve Understanding of Energy Concepts and Creative Thinking Skills Through the MHP Project. 7(1), 77–84.

Gonzalez, H. B., & Kuenzi, J. J. (2012). *Science, technology, engineering, and mathematics (STEM) education: A primer*.

Gonzalez, HB, & Kuenzi, JJ (2012). Mathematics (STEM) Education: A Primary.

Irma, E., Davidi, N., Sennen, E., & Supardi, K. (2016). Implementation of STEM (Science, Technology, Engineering and Mathematical) Approach to Improve Critical Thinking Skills of Elementary School Students. 24-31.

Khoiriyah, N., & Wahyudi, I. (2019). Implementation of the STEM learning approach to improve the critical thinking skills of high school students on sound wave material. March. https://doi.org/10.12928/jrkpf.v5i2.9977

Munandar, U. (2009). Creative development of gifted children. Rineka Cipta.

Oey, M., Rahayu, E. (2017). Era of Disruption: opportunities and challenges of Indonesian higher education. Indonesian Academy of Sciences.

Putro, H. P. N. (2020). *Revitalisasi Nilai-Nilai Transportasi Tradisional dalam Pembelajaran IPS di Kalimantan Selatan*.

Rahmawati, A. F. (2020). *ANALISIS KEMAMPUAN GURU DALAM MENGEMBANGKAN MATERI PEMBELAJARAN SEBAGAI REALISASI KOMPETENSI PROFESIONAL*. Universitas Pendidikan Indonesia.

Setyawan. Doni. (2021). *Indische Partij*. www. Youtube.com.

Syarifuddin, S., Aisyah, S., & Triana, Y. (2022). Meningkatan Motivasi Belajar Peserta Didik pada Pembelajaran Tatap Muka Usai Belajar Online Akibat Pandemi Covid-19. *Edukatif: Jurnal Ilmu Pendidikan*, *4*(1), 278–288.

Syukur, I. A. (2014). Profesionalisme guru dalam mengimplementasikan teknologi informasi dan komunikasi di kabupaten nganjuk. *Jurnal Pendidikan Dan Kebudayaan*, *20*(2), 200–210.

Sanders, M. (2009). STEM, STEM Education, STEMmania. 20–27.

Sabandar, J. (2013). Reflective Thinking in Mathematics Learning. UPI Graduate School

Mathematics Education Study Program.
Sumarni, W., Wijayati, N., & Supanti, S. (2019). Students' Cognitive Ability and Creative Thinking Through Project-Based Learning with a STEM Approach. 4(1), 18–30.
Sukmana, RW (2018). Implementation of STEM Approach (Science, Technology, Engineering And Mathematics) To Improve Students' Critical Thinking Skills. 1.
Syukri, M., Halim, L., & Meerah, TSM (2013). STEM Education in Entrepreneurial Science Thinking "ESciT": A Sharing Experience from SMEs for ACEH.
Sugiyono. (2015). Combination Research Methods (Mix Methods). Bandung: Alphabeta.
Supardi. (2015). Authentic Assessment. Jakarta: King Grafindo Persada
Widiastuti, A., & Indriana, AF (2019). Analysis of the Application of the STEM Approach to Overcome the Low Creative Thinking Ability of Students on Opportunity Materials. 7(3), 403–416.
Wena, M. (2011). Contemporary innovative learning strategies: An operational conceptual review (F. Yustianti (ed.); Ed.1, cet.). Earth Literature.
Widiastuti, A., & Indriana, A. F. (2019). Analisis Penerapan Pendekatan STEM untuk Mengatasi Rendahnya Kemampuan Berpikir Kreatif Siswa pada Materi Peluang. *UNION: Jurnal Ilmiah Pendidikan Matematika*, *7*(3), 403.