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| RESEARCH ARTICLE

React Strategy on Mathematical Reasoning Reviewed from Students' Interest In Learning Mathematics

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| ABSTRACT

This study aims to determine whether the REACT strategy effectively enhances students' mathematical reasoning based on their interest in learning, specifically for students in class X at SMA Negeri 1 Asparaga. The study employed a quasi-experimental with a 2 × 2 treatment-by-level design, analyzed using two-way ANOVA and Tukey's test. The findings are as follows: (1) The REACT strategy is more effective than conventional teaching methods in enhancing students' interest in learning (Fcount = 27.230 > Ftable = 4.105) and average scores of 44.79 & 34.52; (2) There is a significant interaction between the teaching model and students' interest in learning on their mathematical reasoning (Fcount = 7.534 > Ftable = 4.105); (3) Among students with high interest in learning, the REACT strategy outperforms the conventional model, with a significant result (calculated significance with SPSS v.23 = 1.000 > 0.05) and average scores of 57.50 & 44.11; (4) Among students with low interest in learning, the REACT strategy also demonstrates superiority over the conventional model in critical mathematical thinking, with a significant result (calculated significance with SPSS v.23 = 0.314 > 0.05) and average scores of 31.71 & 27.56.

| KEYWORDS

REACT Strategy, Mathematical Reasoning, Learning Interest

| ARTICLE INFORMATION

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A- Introduction

Mathematics is vital as it significantly contributes to the advancement of science and the development of human resources. It is essential in solving everyday problems and is taught according to students' cognitive, affective, and psychomotor development at every educational level, from preschool through secondary school. According to the Content Standards outlined in the Indonesian Ministerial Regulation No. 22 of 2006, mathematics education aims to enhance conceptual understanding, reasoning ability, mathematical communication skills, and problem-solving capabilities. The school mathematics curriculum stipulates that secondary school students must master two fundamental mathematical skills: reasoning and connection.

Thus, mathematical reasoning should be a core skill for students. Shadiq, as cited in Arigiyati (2017), asserts that mathematical material and reasoning abilities are intrinsically linked. Reasoning helps students understand mathematics and apply their reasoning to comprehend emerging mathematical concepts. Without connections, students may learn and memorize many isolated mathematical concepts and procedures. Therefore, the ability to make connections is crucial in mathematics education to facilitate problem-solving.

According to Rahmatina et al. (2014), when students study mathematics, they must understand the relationships between mathematical concepts and across other subject areas. When students can connect these concepts, their understanding of mathematical material improves. Hence, developing mathematical connection skills is essential from an early stage, as it enhances their comprehension of the material.

The researchers observed class X mathematics teachers at SMA Negeri (State Senior High School) 1 Asparaga. The findings indicate that many students still struggle to link mathematical topics. They also face difficulties connecting concepts between mathematical topics and with topics from other subjects. To address these issues and enhance mathematical connection skills, an appropriate mathematics teaching approach is necessary to align with the educational content and facilitate meaningful learning processes. Mathematics instruction is a context where students can relate their problems and skills, which is in line with Ruseffendi's (1998) assertion that one of the competencies of a mathematics teacher is the ability to demonstrate various teaching methods and techniques within the subject area. Teachers can employ different teaching models, techniques, and strategies, such as the Relating, Experiencing, Applying, Cooperating, And Transferring (REACT) strategy.

Directorate General of Primary and Secondary Education Team states that the REACT strategy represents contextual learning, wherein teachers assist students in connecting lessons to real-world situations (as cited in Putri & Santosa, 2015). This strategy also encourages students to establish links between what they know and how to apply this knowledge in daily life as members of families or communities. In short, REACT-based learning aims to enhance connection abilities.

Based on the aforementioned background, the author examines students' abilities in mathematical connections and self-regulated learning by implementing the Relating, Experiencing, Applying, Cooperating, and Transferring (REACT) learning model. The study focuses on **"REACT Strategy (Relating, Experiencing, Applying, Cooperating, and Transferring) on Mathematical Reasoning Reviewed from Students' Learning Interests."**

B. Methodology

This study was conducted using a quasi-experimental of a pretest-posttest control group design involving two classes. The details of the research design are as follows (Sugiyono, 2013):

Table 1. Research Design

Group	**Pre-Test**	**Treatment**	**Post-Test**
Experiment	O_1	X	O_2
Control	O_2	Conventional	O_2

Note:
X : Treatment involving learning with the REACT strategy
O_1 : Pretest
O_2 : Posttest

Data collection techniques involved administering questionnaires and conducting interview. Questionnaire was used to gather data on Learning Interest, while data on Mathematical Reasoning was obtained from students' mathematics test results and measured by a Likert scale. On the other hand, an interview was conducted to support the data obtained. The data analysis was performed using descriptive statistical analysis to depict the characteristics of score distribution for each variable studied. Inferential statistical analysis was used to test the research hypotheses through classical assumption testing.

C. Findings and Discussion

Research Findings

1. Inferential Analysis

Data Normality

The normality test aims to determine whether the collected data is normally distributed. The normality test was conducted using the Shapiro-Wilk test. The decision criteria used is the significance value > α=0.05, where α represents the level of confidence error. Based on the results from IBM SPSS Statistics 27, the findings are as follows:

Table 2. Data Normality

GROUP	**n**	**Count Significance Level**	**α = 0.05**	**conclusion**
A1	60	0,198	0.05	Normal
A2	58	0,105	0.05	Normal
B1	38	0,240	0.05	Normal
B2	38	0,227	0.05	Normal

A1B1	19	0,249	0.05	Normal
A1B2	19	0.227	0.05	Normal
A2B1	19	0,194	0.05	Normal
A2B2	91	0.312	0.05	Normal

Note:
A1B1: Mathematics test results for students with high learning interest taught using the REACT strategy
A1B2: Mathematics test results for students with low learning interest taught using the REACT strategy
A2B1: Mathematics test results for students with high learning interest taught using conventional methods
A2B2: Mathematics test results for students with low learning interest taught using conventional methods

According to the Shapiro-Wilk test criteria using SPSS, if the α count > 0.05, then the data is normally distributed. As shown in Table 2, all data have α count > 0.05. Thus, the sample groups used in the study are from populations that are normally distributed.

Data Homogeneity
This study conducted two types of homogeneity tests: the two-variance homogeneity test and the four-variance homogeneity test. The two-variance homogeneity test was performed on two pairs of data groups: (1) Mathematics test results for students taught using the REACT strategy (A1) versus those taught using conventional methods (A2); (2) Mathematics test results for students with high learning interest (B1) versus those with low learning interest (B2).

The four-variance homogeneity test was performed on four pairs of data groups: (1) Mathematics test results for students with high learning interest taught using the REACT strategy (A1B1); (2) Mathematics test results for students with low learning interest taught using the REACT strategy (A1B2); (3) Mathematics test results for students with high learning interest taught using conventional methods (A2B1); (4) Mathematics test results for students with low learning interest taught using conventional methods (A2B2).

Table 3. Two-Variance Homogeneity

Group	N	Df	F_{count}	F_{table}	Conclusion
A1	60	59	1,343	1,544	Homogeneous
A2	58	57			
B1	25	24	1,620	1,730	Homogeneous
B2	16	15			

Note:
A1 : Mathematics test results for students taught using the REACT strategy.
A2 : Mathematics test results for students taught using conventional methods.
B1 : Mathematics test results for students with high learning interest.
B2 : Mathematics test results for students with low learning interest.

Table 4. Four-Variance Homogeneity

Data Group	Combined Variance	Log Combined Variance	B	X^2 Count	X^2 Table
A1B1	3,781	0,578	41,585	3,280	92,808
A1B2					
A2B1					
A2B2					

Note:
A1B1: Mathematics test results for students with high learning interest taught using the REACT strategy.
A1B2: Mathematics test results for students with low learning interest taught using the REACT strategy.
A2B1: Mathematics test results for students with high learning interest taught using conventional methods.
A2B2: Mathematics test results for students with low learning interest taught using conventional methods.

From the above table, it is observed that x^2_{count} = 3,280 < x^2_{table} = 92,808, thus, the null hypothesis (H0) is confirmed. This indicates that there are no significant differences in variances among the four groups tested, concluding that the data groups are homogeneous.

The results of the tests show that the data is from a normally distributed population and that the data groups have homoeneous population variances. These results meet the requirements for a two-way ANOVA test, allowing the data to be used for hypothesis testing.

Hypothesis Testing
The hypothesis was tested using a two-way ANOVA (2 × 2) analysis technique, followed by a post hoc Tukey test if an interaction effect was found. The Tukey test aims to determine the significance of interactions among the research variables. The results of the two-way ANOVA analysis, computed using SPSS v.23, are summarized in Table 5 below.

Table 5. Two-Way ANOVA Results

Source of Variance	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F count	F table (α=0.05)
Learning Strategy (A)	515,842	1	515,842	136,441	3,974
Learning Interest (B)	398,368	1	398,368	105,369	3,974
Interaction of Learning Strategy and Interest (AB)	19,000	1	19,000	5,026	3,974
Error within cells (d)	272,211	72	3,781		
Total (T)	1.205,421	75			

From the two-way ANOVA results in Table 5, the following conclusions can be drawn for the first and second hypotheses:

a. First Hypothesis Testing

The first hypothesis of the study is: "There is a difference in mathematics learning outcomes between students taught with the REACT strategy and those taught with conventional methods."

H1: The average mathematics learning outcome for students taught with the REACT strategy is higher compared to those taught with conventional methods; and H0: The average mathematics learning outcome for students taught with the REACT strategy is lower compared to those taught with conventional methods. The testing criterion used is that if the F count > F table at a significance level of 0.05, then H1 is confirmed and H0 is rejected. Conversely, if F count < F table, then H1 is rejected and H0 is confirmed.

Furthermore, from the t-test results, the F count value obtained is 136.441, which is greater than the F table value of 3.974 at a significance level of α = 0.05 with numerator df = 1 and denominator df = 72. This indicates that the null hypothesis (H0), which states there is no difference in mathematics learning outcomes between students taught with the REACT strategy and those taught with conventional methods, **is rejected**. Therefore, the alternative hypothesis (H1), which suggests there is a difference in outcomes, **is confirmed**. This difference in learning outcomes is reflected in the average scores: the REACT strategy group (A1) has an average score of 15.02, which is higher than the average score of 11.21 for the conventional method group (A2). These findings support the first hypothesis proposed.

b. Second Hypothesis Testing

The second hypothesis in this study is: "There is an interaction effect between Learning Strategy and Learning Interest on Mathematics learning outcomes among students."

H1: There is an interaction effect between Learning Strategy and Learning Interest on Mathematics learning outcomes among students; and H0: There is no interaction effect between Learning Strategy and Learning Interest on Mathematics learning outcomes among students. The testing criterion used is that if F count > F table at a significance level of 0.05, then H1 is confirmed and H0 is rejected. Conversely, if F count < F table, then H1 is rejected and H0 is confirmed.

From the t-test results, the F count value is 5.026, greater than the F table value of 3.974 at a significance level of α = 0.05 with numerator df = 1 and denominator df = 72. This indicates that the null hypothesis (H0), which states no interaction effect between

Learning Strategy and Learning Interest on Mathematics learning outcomes, **is rejected**. Thus, the alternative hypothesis (H1), which suggests an interaction effect, **is confirmed**.

Given the significant interaction effect between Learning Strategy and Learning Interest on Mathematics learning outcomes, a post hoc Tukey test was conducted. The Tukey test is used to compare all pairs of treatment means following the two-way ANOVA. The results of the Tukey test, summarized using SPSS v.23, are shown in Table 6 below.

Table 6. Tukey Post Hoc Test Results

Interaction	N	Mean		
		1	2	3
A2B2	19	7,42		
A1B2	19		13,00	
A2B1	19		13,63	
A1B1	19			17,21
Significance		1,000	0,749	1,000

c. Third Hypothesis Testing

The third hypothesis of the study is: "For students with high interest in learning, those taught using the REACT strategy will achieve higher mathematics learning outcomes compared to those taught using direct instruction."

H0: the average mathematics learning outcomes for students with high interest, who are taught using the REACT strategy, are lower than those taught using direct instruction. Conversely, the alternative hypothesis (H1) suggests that the average outcomes for students with high interest, taught using the REACT strategy, are higher than those taught with direct instruction.

To test this hypothesis, the researcher compared the average mathematics learning outcomes between students taught with the REACT strategy and those taught with direct instruction within the group of students with high interest.

The analysis shows that the mean score for students with high interest taught using the REACT strategy is 17.21, whereas the mean score for those taught with direct instruction is 13.00. This indicates that students with high interest who were taught using the REACT strategy performed better compared to those who received direct instruction. Consequently, the null hypothesis (H0) **is rejected**, and the alternative hypothesis (H1) **is confirmed**. The significance value of the comparison between groups A1B1 and A2B1 is 1.00, which is greater than the 0.05 threshold. According to SPSS criteria, a significance value greater than 0.05 indicates that H0 is rejected and H1 is confirmed.

d. Fourth Hypothesis Testing

The fourth hypothesis of this study is: "For students with low interest in learning, those taught using the REACT strategy will achieve higher mathematics learning outcomes compared to those taught using direct instruction."
H0: the average mathematics learning outcomes for students with low interest, taught using the REACT strategy, are lower than those taught using direct instruction. Conversely, the alternative hypothesis (H1) suggests that the average outcomes for students with low interest, taught using the REACT strategy, are higher than those taught with direct instruction.

To test this hypothesis, the researcher compared the average mathematics learning outcomes between students taught with the REACT strategy and those taught with direct instruction within the group of students with low interest.

The results indicate that the mean score for low-interest students taught using the REACT strategy is 13.63, while the mean score for those taught with direct instruction is 7.42. This demonstrates that students with low interest who were taught using the REACT strategy performed better than those who received direct instruction.

Thus, the null hypothesis (H0) **is rejected**, and the alternative hypothesis (H1) **is confirmed**.

The significance value for the comparison between groups A1B2 and A2B2 = 0,749 > 0,05. According to SPSS criteria, a significance value greater than 0.05 indicates **H0 is rejected** and **H1 is confirmed**.

Discussion

a. Differences in Mathematics Learning Outcomes between REACT and Direct Instruction

In this study, the experimental group (taught using the REACT strategy) consisted of 60 students from classes X-1 and X-5, with an average mathematics learning outcome of 15.02. The control group (taught using direct instruction) included 58 students from classes X-2 and X-4, with an average score of 11.21.

Based on the results of the first hypothesis using a two-way ANOVA, it was observed that there is a significant difference in mathematics learning outcomes between students taught using the REACT learning strategy and those taught using direct instruction. This is evidenced by the average scores of mathematics learning outcomes for each group, where students taught using the REACT strategy achieved higher average scores than those taught with direct instruction. Overall, this indicates that the REACT learning strategy is superior to direct instruction.

The REACT strategy (Relating, Experiencing, Applying, Cooperating, Transferring) is a contextual learning approach rooted in the fundamental principles of constructivism. It involves efforts to build and utilize knowledge in science education, requiring students to engage in continuous activities. When employing the REACT strategy, instructional materials are presented through contexts relevant to students' lives, making learning more meaningful and enjoyable. Furthermore, the REACT strategy demands that students actively participate in their learning, thereby enhancing their retention of concepts acquired during the instructional process. In the REACT framework, new information should be linked to prior knowledge, integrating with students' existing schemata. Additionally, the REACT strategy emphasizes investigation and discovery, which fundamentally involves problem-solving. As reflected in the acronym REACT—Relating, Experiencing, Applying, Cooperating, and Transferring—the mathematics instruction using this strategy incorporates these five components.

(1) Relating: in this stage, the learning process should involve connections with prior knowledge that students already possess and understand, such as skills, talents, interests, and exposure to educational media with the assistance of the mathematics teacher. The aim is for students to comprehend the mathematics concepts being taught and to apply these concepts to mathematical problems; (2) Experiencing: during this stage, the emphasis is on exploration, discovery, and the creation of new mathematical concepts. Students are encouraged to use various learning resources and media to facilitate this process; (3) Applying: in this stage, students apply the concepts acquired from previous learning to solve existing mathematical problems. Teachers can provide realistic and relevant exercises demonstrating mathematics's utility in everyday life; (4) Cooperating: at this stage, the learning process helps students understand the material and reinforces contextual learning by promoting communication and collaboration among students. Teachers guide students to work together to achieve the desired outcomes; (5) Transferring: this phase involves applying the knowledge students have gained to new contexts or situations not previously addressed in class. It may include presentations of findings from student discussions, allowing students to share mathematical information and generate new understanding collaboratively.

In contrast to the REACT strategy, the stages of direct instruction emphasize the delivery of learning material from the teacher to the students. The goal of this instructional approach is for students to master the provided mathematics content effectively. However, in practice, this method often leads to passive student involvement in the learning process, with students acquiring new mathematical concepts solely through the material presented by the teacher. In other words, the teacher plays a dominant role in the mathematics instruction process, which results in some students not having the opportunity to develop their own understanding but instead merely applying the material provided by the teacher to practice problems.

In short, the REACT learning strategy, both in terms of the learning stages implemented and the instructional materials used by teachers, is superior to direct instruction. The REACT strategy is therefore deemed suitable for use as a teaching approach in schools. This finding confirms the validity of the proposed research hypothesis.

b. Influence of Interaction between Teaching Strategy and Learning Interest on Mathematics Outcomes

Based on the results of the two-way ANOVA test concerning the interaction effect between variable A (learning strategy) and variable B (learning interest), F count = 5,026 > F table = 3,974 at a significance level = 0,05. Therefore, H0 is rejected and H1 is confirmed, indicating an influence of interaction between the learning model and emotional intelligence.

Learning interest significantly influences the effectiveness of the REACT learning strategy (Relating, Experiencing, Applying, Cooperating, Transferring) with respect to mathematics learning outcomes. This significance is evident from the stages of the REACT strategy, where indicators of learning interest are interrelated. The findings are consistent with the theoretical framework previously explained about the REACT strategy and learning interest, and are supported by relevant studies. Thus, the interaction between the REACT learning strategy and students' learning interest significantly influences mathematics learning outcomes.

This implies that the influence of interaction between the learning strategy and learning interest is ≠ zero (0), meaning it significantly influences students' mathematics learning outcomes.

c. For students with High Learning Interest, Those Taught Using the REACT Strategy Achieve Better Mathematics Learning Outcomes Compared to Those Taught Using Direct Instruction.

The data analysis reveals a significant difference in mathematics learning outcomes between students with high learning interest who were taught using the REACT strategy and those who were taught using direct instruction. This difference is evident from each group's average scores of mathematics learning outcomes.

Specifically, the average score for mathematics learning outcomes for students with high learning interest taught using the REACT strategy is 17.21. In contrast, the average score for students with high learning interest taught using direct instruction is 30.00.

The REACT strategy offers several advantages in teaching, including deepening students' understanding of mathematics, fostering self-confidence so students can express the concepts they have learned, and promoting mutual respect and collaboration among students and between students and teachers to achieve desired outcomes. Additionally, the REACT strategy enhances skills development to make the learning process more inclusive and engaging, thereby increasing students' interest in learning through enjoyable activities.

As a result, students with high learning interests who are taught the REACT strategy achieve better mathematics learning outcomes than those taught with direct instruction. This aligns with the data analysis, which supports the confirmation of the alternative hypothesis (H1) and the rejection of the null hypothesis (H0).

d. For students with Low Learning Interest, Those Taught Using the REACT Strategy Achieve Better Mathematics Learning Outcomes Than Those Taught Using Direct Instruction.

The data analysis indicates a significant difference in mathematics learning outcomes between students with low learning interest who were taught using the REACT strategy and those taught using direct instruction. This difference is evident from each group's average scores of mathematics learning outcomes.

Specifically, the average score for mathematics learning outcomes for students with low learning interest taught using the REACT strategy is 13.63, whereas the average score for those taught using direct instruction is 7.42. These findings suggest that the REACT strategy is more effective for students with initially low mathematical abilities.

In direct instruction, the learning process emphasizes students understanding the material directly without explaining the underlying reasons behind mathematical concepts. In contrast, the REACT learning strategy encourages students to discover mathematical concepts on their own, allowing them to understand the material in a way that suits them individually. For students with low learning interest, it is essential to introduce factors that can capture their attention and motivate them to engage with mathematics. The REACT strategy is particularly suitable for this purpose, as it is designed to engage students through various stages or components: (1). Relating: students are guided to connect previously learned concepts with new mathematical concepts they will study, helping to build a coherent understanding; (2) Experiencing: students engage in various experiences and use existing learning media, making them more proactive in the learning process; (3) Applying: students are directed to apply mathematical concepts to solve problems or complete exercises, reinforcing their understanding through practical application; (4) Cooperating: this phase fosters collaboration among students and boosts their confidence, as they work together and validate their understanding by discovering concepts independently; (5) Transferring: in the final stage, students share their findings with each other, thereby expanding their knowledge based on the information presented by their peers.

Thus, for students with low learning interest, the average mathematics learning outcomes of those taught using the REACT strategy are superior to those taught using direct instruction. This finding aligns with the data analysis results, which support the confirmation of the alternative hypothesis (H1) and the rejection of the null hypothesis (H0).

D. Conclusion

The objective of the study was to ascertain the efficacy of the REACT (Relating, Experiencing, Applying, Cooperating, and Transferring) strategy in augmenting students' mathematical reasoning and learning outcomes, particularly in relation to their inclination towards learning mathematics. The research was designed to determine whether students who were taught using the REACT strategy would perform better in mathematics than those taught using conventional instruction, and whether there is an interaction between teaching strategies and students' interest in learning. The study demonstrates that the REACT strategy markedly outperforms conventional teaching methods in enhancing students' mathematical reasoning and learning outcomes. Furthermore, the study revealed a notable interaction between the REACT strategy and students' interest levels, indicating that the strategy is effective for both high- and low-interest students, with particularly enhanced outcomes in mathematical reasoning compared to conventional approaches. The quasi-experimental design and limited sample size may restrict the generalizability of the results to a broader population, despite the success of this strategy. Furthermore, the study was based on a specific set of instructional methods and mathematical topics, which may limit its applicability to other areas of mathematics or different educational contexts. It is recommended that the study be expanded by involving a larger, more diverse sample size and applying the REACT strategy across various mathematical topics and educational levels. Additionally, further research could examine the long-term effects of the REACT strategy on students' mathematical reasoning and assess its effectiveness in enhancing other skills, such as mathematical communication or critical thinking.

Reference

[1] Agustin, R. D. (2016). *Kemampuan penalaran matematika mahasiswa melalui pendekatan problem solving*. *PEDAGOGIA: Jurnal Pendidikan*, *5*(2), 179-188.

[2] Ahdianti, N. (2018). Analisis Minat Belajar Pendidikan Agama Islam Siswa SMA Negeri 03 Bombana Kecamatan Rumbia Kabupaten Bombana (Doctoral dissertation, IAIN KENDARI).

[3] Anonim. Bab II Kajian Teori. Jurnal Skirpsi, Tersedia Di : Http://Digilib.Uinsby.Ac.Id/10392/5/Bab%202.Pdf (25 Oktober 2023)

[4] Arigiyati, T. A. (2017). Pengaruh Minat dan Perhatian Orang tua Terhadap Prestasi Belajar Matematika Siswa SMP. Transformasi: Jurnal Pendidikan Matematika Dan Matematika, 1(1).

[5] Asmi, Annisa Wahidatul. (2018) Pengembangan Lembar Kerja Siswa (LKS) Berbasis Project Based Learning(Pjbl) Untuk Memfasilitasi Kemampuan Penalaran Matematis Siswa Sekolah Menengah Pertama / Madrasah Tsanawiyah. Skripsi Thesis, Universitas Islam Negeri Sultan Syarif Kasim Riau.

[6] B. Uno. Hamzah. (2009). Model Pembelajaran Cetakan Ke V. Jakarta: PT Bumi Aksara

[7] Hanafiah, N., & Suhana, C. (2009). Konsep Strategi Pembelajaran, Bandung: PT. Refika Aditama.

[8] Hartati, M., & Surya, E. (2017). Peningkatan Kemampuan Komunikasi dan Penalaran Matematis Siswa dengan Menggunakan Model Pembelajaran Kooperatif Tipe STAD pada SMK di Pangkalan Brandan. unimed. ac. id.

[9] Hendriana, H., E. E. Rohaeti, dan U. Sumarmo. (2018). Hard Skills Dan Soft Skills Matematik Siswa. Bandung: PT Refika Aditama

[10] Herdiana, H., Rohaeti, E.E., & Sumarmo, U. (2017). Hard Skills dan Soft Skills. Matematika Siswa. Bandung: Refika Aditama

[11] Hidayati, D. S. (2015). Self compassion dan loneliness. Jurnal Ilmiah Psikologi. Terapan, 3(1)

[12] Huda, Miftahul. (2013). Model-model Pengajaran dan Pembelajaran. Yogyakarta: Pustaka Pelajar.

[13] Komariah, N., Mujasam, M., Yusuf, I., & Widyaningsih, S. W. (2019). Pengaruh penerapan model pbl berbantuan media google classroom terhadap hots, motivasi dan minat peserta didik. Silampari Jurnal Pendidikan Ilmu Fisika, 1(2), 102-113

[14] Kurniawati, R., Nendra, F., Netriwati, N., & Andriani, S. (2021). Dampak strategi relating, experiencing, applying, cooperating dan transferring (REACT) pada kemampuan penalaran matematis ditinjau dari minat belajar. Edu Sains: Jurnal Pendidikan Sains Dan Matematika, 9(1), 33-39.

[15] Mulia, O.S. (2014). Meningkatkan Kemampuan Penalaran Adaptif Siswa Sekolah Menengah Atas melalui Pendekatan Pembelajaran Matematik Realistik(PMR). Skripsi Sarjana Pendidikan Matematika FKIP UNPAS Bandung. Tidak Diterbitkan.

[16] Muslich, M. (2007). KTSP: pembelajaran berbasis kompetensi dan kontekstual, panduan bagi guru, kepala sekolah, dan pengawas sekolah. Bumi Aksara..

[17] Napitupulu, E. E., Suryadi, D., & Kusumah, Y. S. (2016). Cultivating upper secondary students' mathematical reasoning-ability and attitude towards mathematics through problem-based learning. Journal on mathematics education, 7(2), 117-128.

[18] NCTM. (2000). Principles and Standards for School Mathematics. United States of America : The National Council of Teachers of Mathematics, Inc

[19] Novri, U. S., Zulfah, Z., & Astuti, A. (2018). Pengaruh Strategi React (Relating, Experiencing, Applying, Cooperating, Transfering) Terhadap Kemampuan Pemahaman Konsep Matematis Peserta Didik Kelas Vii Smp Negeri 1 Bangkinang. Jurnal Cendekia: Jurnal Pendidikan Matematika, 2(2), 81-90.

[20] ÖZBAY, A., & KAYAOĞLU, M. (2015). The use of REACT strategy for the incorporation of the context of physics into the teaching English to the physics English prep students. Tarih Kultur Ve Sanat Arastirmalari Dergisi-Journal Of History Culture And Art Research, 4(3)..

[21] Permana, Y., & Sumarmo, U. (2007). Mengembangkan kemampuan penalaran dan koneksi matematik siswa SMA melalui pembelajaran berbasis masalah. Jurnal Educationist, 1(2), 116-123.

[22] Pratama, D., & Susanti, E. (2019). Pengaruh Strategi Relating, Experiencing, Applying, Cooperating, Transferring (REACT) Terhadap Kemampuan Koneksi Matematis Siswa SMP Dharma Bhakti Palembang. Nabla Dewantara, 4(2), 8-16.

[23] Priansa, D. J. (2017). Pengembangan strategi dan model pembelajaran: inovatif, kreatif, dan prestatif dalam memahami peserta didik.

[24] Putri, R. I., & Santosa, R. H. (2015). Keefektifan strategi REACT ditinjau dari prestasi belajar, kemampuan penyelesaian masalah, koneksi matematis, self-efficacy. Jurnal Riset Pendidikan Matematika, 2(2), 262-272.

[25] Rahmatina, S., Sumarmo, U., & Johar, R. (2014). Tingkat berpikir kreatif siswa dalam menyelesaikan masalah matematika berdasarkan gaya kognitif reflektif dan impulsif. Jurnal Didaktik Matematika, 1(1).

[26] Rayhan, Contextual Teaching And Learning With React Strategy, Http://Edmymatheducation.Blogspot.Co.Id , Pada Tanggal 30 Oktober 2023 Pukul 09.13)

[27] Rowntree, D. (1994). Preparing materials for open, distance and flexible learning: An action guide for teachers and trainers. (No Title).

[28] Ruseffendi, E. T. (1998). Dasar-Dasar Matematika Modern untuk Guru, Edisi Ketiga.

[29] Sanjaya, I. P. H. (2012). Pengaruh Model Pembelajaran Inkuiri Laboratorium Terhadap Keterampilan Berpikir Kreatif dan Keterampilan Proses Sains Siswa Ditinjau dari Kemandirian belajar Siswa. Jurnal Pendidikan dan Pembelajaran IPA Indonesia, 2(2)

[30] Sari, Rica Maya. (2018) Pengaruh Penerapan Strategi React (Relating, Experiencing, Applying, Cooperating, Transfering) Terhadap Kemampuan Penalaran Matematis Siswa Ditinjau Dari Kemampuan Awal Siswa Sekolah Menengah Pertama Di Kabupaten Bengkalis. Skripsi Thesis, Universitas Islam Negeri Sultan Syarif Kasim Riau.
[31] Subanindro, M. P. (2012). Pengembangan perangkat pembelajaran trigonometri berorientasikan kemampuan penalaran dan komunikasi matematik siswa SMA. Kontribusi Pendidikan Matematika dan Matematika dalam Membangun Karakter Guru dan Siswa.
[32] Sugiyono, S., & Lestari, P. (2021). Metode penelitian komunikasi (Kuantitatif, kualitatif, dan cara mudah menulis artikel pada jurnal internasional).
[33] Sugiyono. (2013). Metodelogi Penelitian Kuantitatif, Kualitatif Dan R&D. Bandung: Alfabeta.
[34] Sugiyono. (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung : Alfabeta
[35] Suharsimi. (2010). Prosedur Penelitian Suatu Pendekatan Praktik. Jakarta: Rineka Cipta
[36] Sumartini, Tina Sri. (2015). Peningkatan Kemampuan Penalaran Matematis Siswa Melalui Pembelajaran Berbasis Masalah,‖ Jurnal Pendidikan Matematika Mosharafa, Vol. 5, No. 1
[37] Trianto.(2010). Model Pembelajaran Terpadu, Konsep, Strategi dan. Implementasinya dalam KTSP. Jakarta: Bumi Aksara
[38] Ültay, N., & Çalik, M. (2016). Research Article Published online on Jul 01, 2016. EURASIA Journal of Mathematics, Science and Technology Education, 12(1), 57-86.
[39] Ulum, Miftahul (2018) Efektivitas Strategi React (Relating, Experiencing, Applying, Cooperating, Transfering) Terhadap Hasil Belajar Dan Keterampilan Proses Sains Di Smp N 22 Bandar Lampung. Undergraduate Thesis, Uin Raden Intan Lampung.
[40] Yusri, Devi Wilda. (2018) Pengaruh Lingkungan Keluarga Terhadap Minat Belajar Siswa Pada Mata Pelajaran Ekonomi di Sekolah Menengah Atas Negeri 1 Kampar Timur. Skripsi Thesis, Universitas Islam Negeri Sultan Syarif Kasim Riau.