Pegem Journal of Education and Instruction, Vol. 14, No.2, 2024 (pp. 146-151)

RESEARCH ARTICLE WWW.PEGEGOG.NET

The Use Of Instagram Media Is Integrated With The Inquiry Learning Model To Improve Critical Thinking Skills And Student Learning Motivation In The Matter Of Reaction Rates

Hayuni Retno Widarti[1*], Deni Ainur Rokhim[2], Afis Baghiz Syafruddin[3], Ilviana[4]
[1,2,3,4]Chemistry Education, Malang

Abstract

The aim of this study was to see the effect of using the Instagram media-integrated inquiry learning model in increasing learning motivation and students' critical thinking skills in the matter of reaction rates. This research is a Quasi Experimental Design type. Population consist of class XI MIPA students of SMAN 1 Turen. Sampling used the Simple Random Sampling technique and it was found that there were 32 students in class XI MIPA 4 as the sample for the class of experimental and for class XI MIPA 5 with 32 students as the sample for the class of control. Data analysis used qualitative and quantitative descriptive tests with independent sample-t tests and N-Gain. Qualitative analysis showed an increase in learning motivation in the class of experimental (74%) higher than the class of control (64%). Statistical analysis showed that there were significant differences in students' critical thinking skills with sig. (2-tailed) 0.000 < 0.05. The N-Gain test showed an increase in the critical thinking skills of the class of experimental (0.82) higher than the class of control (0.72). The results of this analysis indicate that the inquiry learning model integrated with Instagram media is able to increase learning motivation and students' critical thinking skills in the material of reaction rate.

Keywords: learning motivation, critical thinking, reaction rate, Inquiry and Instagram.

Introduction

Natural science is part of education which plays an important role in realizing quality education (Mukmainah, 2020). One branch of natural science is chemistry. Chemistry is related to how to relate theory to natural phenomena, so that in the learning process not only mastering a some insight into facts, principles, but is also part of the discovery process. By studying chemistry, it is hoped that students will gain experience related to the application of the scientific method with experiments (Widyasari et al., 2021). This is in accordance with Regulation of the Minister of National Education no. 26 of 2006 regarding the objectives of the Graduate Skills Standards for Education Units (SKL-SP) for SMA, namely that they required to demonstrate logical, creative, critical and innovative thinking skills in making a decision. Critical thinking is a future competency requirement that students need to have.

Critical thinking is reasonable and reflective thinking to be able to decide something based on scientific thinking (Widyasari et al., 2021). The ability to think critically determines the success of problem solving by connecting concepts with facts or phenomena around them (Firdausy et al., 2020; Rokhim et al., 2023). The skills to think critically is become one of the supporting parts of the success of the chemistry learning process. According to (Facione, 2015), there are several skills in critical thinking, namely interpretation, inference, analysis, explanation, evaluation, and self-regulation. The process in learning chemistry, it's not only students' critical thinking skills that need to be improved. However, learning motivation also needs to be increased to support the chemistry learning process. For this reason, effective and innovative learning is needed to increase level of critical thinking ability and student learning motivation in the proses learning.

Research has previously loaded by Suarsini et al. (2020), by developing learning media based on Instagram social media to increase student motivation and learning outcomes. The these results show that social media can be used as a learning medium that can make it easier for students' to do this go it teaching because material the delivery of material learning is presented in the photos and videos that are interesting and encourage enthusiasm and motivation for student learning. Presentation in the photos and videos can faclitate students to

Corresponding Author e-mail: hayuni.retno.fmipa@um.ac.id
https://orcid.org/10000-0001-5574-8209

How to cite this article: Widarti R H, Rokhim A D, Syafruddin B S, Ilviana (2024), The Use Of Instagram Media Is Integrated With The Inquiry Learning Model To Improve Critical Thinking Skills And Student Learning Motivation In The Matter Of Reaction Rates, Vol. 14, No. 2, 2024, 146-151

Source of support: Nil

Conflict of interest: None.

DOI: 10.47750/pegegog.14.02.18

Received: 16.01.2023
Accepted: 23.04.2023 Publication: 01.04.2024

understand the subject matter properly (Rokhim et al., 2020).

Motivation is a personal internal and external encouragement to make a change. According to Keller in (Widiasrumana, 2017), motivation consists of 4 aspects which include relevance, attention, satisfaction and confidence. Learning motivation is very fundamentals because it can be a driving force in influencing student learning activities and habits as well as doing assignments at school. In addition, motivation is also an important factor in supporting student achievement because with high learning motivation students will always study diligently and concentrate fully in the learning process (Amnawati, 2022). That is, motivation can encourage students to continue learning so they can know the direction of their learning.

Based the result of interview conducted with one of the Chemistry teachers at SMAN 1 Turen, there is an acquisition of students' cognitive scores in class XI regarding the subject matter of chemical equilibrium which is still not optimal. This can be seen from the percentage of students' success in achieving the Minimum Completeness Criteria of around 50%. Ability to do something critically and students' motivation in the learning process still tends to be low and has an impact on learning outcomes. Therefore, there is a need for new innovations in process learning to be competent to overcome the problem of low critical thinking ability and student learning motivation.

Various studies have been conducted related improvement student's critical thinking ability and motivation using certain models. Research conducted previously conducted by Seran et al., (2019) by using the guided inquiry studying to increase critical thinking ability and studying motivation students'. According to Seran (2019), this model provide an increase in students' motivation and critical thinking ability. This is proven by the posttest mean point of experimentall class of students being high than class of control. In the critical thinking ability variable, the mean posttest score for class of experimental was 80.21 and that for the control clas was 72.09. In the student studying motivation variable, the mean posttest score for the class of experimental was 79 and for the class of control was 74. The mean score for the class of experimental and class of control was still relatively low compared to the expected goals. Although the acquisition of Posttest scores has increased, but it is still considered lacking in increasing motivation and critical thinking skills students'. That's because the acquisition of the value of the class of experimental have points almost the same from the acquisition of the class of control.

Previous research was also carried out using the inquiry model to improving mathematical critical thinking skills and studying motivation student's (Wijaya, 2022). According to Wijaya (2022), this model provides results in improving students' mathematical critical thinking skills and studying motivation. This is evidenced by the posttest mean score of students on the variable critical thinking ability of the class of experimental of 74.42 and the class of control of 64.52. In the student studying motivation variable, the posttest mean point for class of experimental was 44.08 which was not much different from the class of control at 40.74. The Posttest point for class of experimental and class of control were not much different, so they were considered to be lacking in an effort to imrpove critical thinking skills and studying motivation students'. Therefore it is necessary to apply a model with the help of media that is able to improve students' critical thinking skills and studying motivation.

According to Yasmin in (Romanah, 2021), the studying model is believed to enhancement students' critical thinking skills is the inquiry studying model. Inquiry studying is that requires students' to process messages so as to gain knowledge and skills. The inquiry studying model is student-centered studying that can improve students' logical thinking skills (Hidayati et al., 2021), so as to make students more active and can improve studying outcomes.

In improving students' critical thinking skills and studying motivation, studying with the inquiry model is considered insufficient (Wijaya, 2022). Therefore, supporting media is needed, where social media can be an option. The use of social media can be said to be effective and able to increase student learning motivation (Widarti et al., 2023). One of the social media that can be used is Instagram. Instagram is a social media that is favored by all circles, especially students. This is evidenced by the number of Instagram media users in Indonesia who have reached 89% with a vulnerable age of 18 to 34 years (Rohim & Yulianti, 2020). These conditions can be used to make Instagram a studying medium, especially the use of Instagram media in studying is something new in the use of social media (Romanah, 2021). This makes Instagram has enormous potential as a medium in studying, especially chemistry to increase student motivation.

In accordance with the background explanation above, the researcher is encouraged to do research entitled "Use of Instagram Media Integrated Inquiry Studying Model as a Reaction Rate Studying Process to Increase Studying Motivation and Students' Critical Thinking Ability". The two goals of this study include: (1) the effect of using Instagram-based inquiry studying models on increasing students' critical thinking skills (2) the effect of using Instagram-based inquiry studying models on increasing student motivation.

METHODE

The method that used in this research is Quasi Experimental Design or pseudo experiment. The research design in this study is the Pretest-Posttest control group design. The population in this study were all of class XI of SMAN 1 Turen for the 2022/2023 academic year, totaling 192 students and divided into 6 classes. The sample used selected based on simple random sampling technique, so that 2 sample classes were selected, namely class XI MIPA 4 with a total of 32 students as the class of experimental and XI MIPA 5 with a total of 32 students as the class of control.

In its implementation, the two classes applied the same studying model in the reaction rate material, namely the inquiry studying model. The difference in treatment lies in the studying media used. In the class of experimental, integrated studying media with Instagram social media was used, while the class of control used Power Point media.

Data collection techniques include the preparation stage, the implementation stage, and the final stage. In the preparatory phase, preparation and validation of research instruments were carried out, preparation of licensing documents for research,

and distribution of questionnaires prior to operational testing. At the data collection stage includes the implementation of studying in schools. In its implementation, the series of stages of the inquiry learning model applied in the study are presented in Table 1.

Table 1: Series of stages of inquiry learning in experimental and control classes

Learning Stages	Experiment Class	Control Class
Orientation	Students are given a problem or phenomenon, then asked to explore information from the problem or phenomenon observed by reviewing the material presented in the Instagram media.	Students are given a problem or phenomenon, then asked to extract information from the problem or phenomenon observed by reviewing the material presented through Power Point.
Formulating the Problem	Students formulate problems in the form of questions related to the problems or phenomena given previously.	Students formulate problems in the form of several questions related to the problem or phenomenon given earlier.
Formulating Hypothesis	Students are asked to hypothesize the formulation of the problem made previously by examining the material presented in Instagram media.	Students are asked to hypothesize the problem formulation made previously by reviewing the material presented through Power Point.
Collecting Data	Students are asked to search and collect data or information to find answers to questions made earlier, where the data obtained is supported by some information from relevant sources to later find the right answer.	Students are asked to find and collect data or information to find the answer to the question made earlier, where the data obtained is supported by some information from relevant sources to later find the right answer.
Testing the Hypothesis	Students are asked to determine whether the previous answer is acceptable or not based on the data or information obtained.	Students are asked to determine whether the previous answer is acceptable or not based on the data or information obtained.
Formulating Conclusions	Students are asked to draw conclusions that can describe the findings based on the results of hypothesis testing.	Students are asked to draw conclusions that can describe the findings based on the results of hypothesis testing.

Based on table 1, in the implementation of the two classes, the same learning model is applied in reaction rate material, namely the inquiry learning model. The difference in treatment lies in the learning media used, where the experimental class uses Instagram learning media. Furthermore, in the final stage, research data analysis, drawing conclusions, and preparing reports or articles are carried out.

The instrument used in this study was a questionnaire consisting of 30 statements that using a Likert Scale distributed via Google Form to measure students' studying motivation levels. Apart from that, there are also Pretest-Posttest questions which consist of 6 multiple choice questions and 6 essay questions to measure students' critical thinking level. Instruments were given before and after the implementation of studying to measure the extent to which the influence of the inquiry studying model with the help of Instagram media was compared to the inquiry studying model with Power Point media. It was previously known that the use of Power Point media was considered still lacking in supporting the success of the learning process. The shortcomings of power Point Media are time-consuming and labor-intensive, can only be operated by Windows and to use power point media requires more expertise (). By utilizing Instagram media, it is hoped that it can support the success of the learning process by increasing student learning motivation.

The data processing techniques include qualitative descriptive tests on studying motivation questionnaires and statistical tests on students' critical thinking questions. Statistical tests that used in this study is the independent sample-t test and the N-Gain test to determine the increase in students' critical thinking skills with the help of the SPSS Statistics 26 program.

Data Analysis And Discussion

Analysis of studying motivation based on data from the questionnaire results of students' studying motivation variables given to the class of control and class of experimental, the results are obtained in Figure 1 with the criteria referring to Table 2:

Table 2: Student Learning Motivation criteria

Class	Criteria
81-100	Highly Motivated
61-80	Motivated
41-60	Moderately Motivated
21-40	Not Motivated
0-20	Very Unmotivated

(Widiasrumana, 2017)

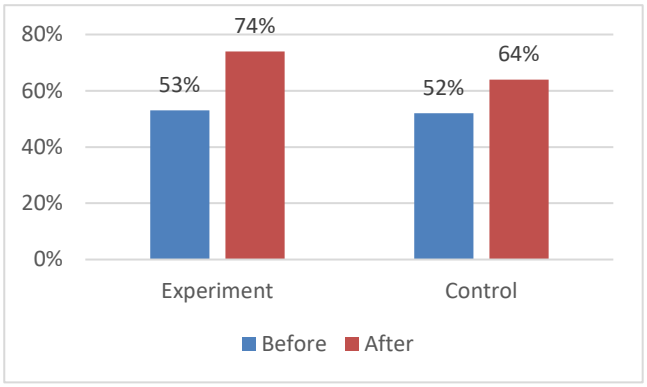

Figure 1: Increasing Student Studying Motivation

Based on Figure 1, it can be seen that student learning motivation has increased. In the experimental class, student learning motivation which was initially 53% (moderately motivated) increased by 21% to 74% (motivated), while in the control class, student learning motivation which was initially 52% (motivated) increased by 12% to 64% (motivated). This means that there is a higher increase in student learning motivation in the class that uses the inquiry learning model assisted by Instagram media compared to the class that uses the inquiry learning model with Power Point media. This happens because students who take part in learning in the experimental class are given treatment with the help of Instagram media, so that students are more enthusiastic and motivated to take part in learning and be actively involved in it.

The result of the above research are in line with research that even conducted by Rosmana (2021) in his research which states that of Instagram is an capable way to increased student motivation. It is supported by Rohim & Yulianti (2020) which states that studying with the help of Instagram media can help students to increase their motivation and studying outcomes. That's because on Instagram, students get material presented in the form of animated videos and infographics, as a result, the studying process that occurs is felt to be more enjoyable. The same thing was also expressed by Amiruddin et al. (2021) and Rokhim et al. (2022) which revealed that Instagram media has a positive influence on increasing student studying motivation, where Instagram media is in great demand among students and can trigger student enthusiasm for studying.

Studying motivation is an important aspect in supporting the success of the studying process. This is in appropriate with the results of the study Rachmawati & Rohaeti (2018) which states that motivation is a trigger for changes in the energy of each individual which is presupposed by a sense of being a driving force for students to learn.

Overall, the experimental and class of controles already cover some of these aspects. It's just that in the class of control there were still some students who paid less attention to the lesson. In addition, there were also some students who were too focused on the tools they tried during the practicum, but did not understand the lesson to be learned, as a result, these students could not understand the lesson properly.

Furthermore, the analysis of students' critical thinking skills, where quantitative tests have been carried out with descriptive statistics assisted by the SPSS Statistics 26 program.

The data used are the results of the Pretest-Posttest of students' critical thinking skills in the control class and experimental class as shown in Table 3:

Table 3: Pretest-Posttest worth data for critical thinking skills

Class	Score	Pretest	Posttest
Experiment	Min	10	73
	max	43	100
	x̄	24,19	86.00
	std. Deviation	9.67	7.86
Control	Min	10	60
	max	40	93
	x̄	24.97	78.08
	std. Deviation	7,33	8,61

Based on Table 3, the class of experimental obtained an mean pretest score of 24.19 and a standard deviation of 9.67 with minimal score of 10 and maximal score of 43 deviations, while for an mean posttest worth of 86.00 and a standard deviation of 7.86 with a minimal score of 73 and a maximal score of 100. In the class of control, an mean pretest score of 24.97 and a standard deviation of 7.33 with a minimum worth of 10 and a maximum worth of 40, while for the mean posttest worth is 78.08 and the standard deviation of 8.61 with a minimal score of 60 and a maximal score of 93. Based on these outputs, it can show that there is an increase in students' critical thinking which is higher in classes that use Instagram media-based inquiry models compared to classes that use inquiry models with Power Point media . This is due to the influence of the use of Instagram media in the inquiry model, where students become motivated to always take part in studying, as a output students' curiosity increases and encourages students to have higher critical thinking skiIls.

Furthermore, before carrying out the independent sample-t tests, normality and homogeneity tests were first carried out. The normality test uses the One Sample Kolmogorov-Smirnov test with the criteria if significances is > 0.05, then the data is normally distributed and the data is obtained as shown in Table 4.

Table 4: Normality test outputs for pretest-posttest critical thinking skills

Class	N	Data	Kolmogorov-Smirnov Sig.	Information
Experiment	32	Pretest	0.072	Normal
		Posttest	0.200	Normal
Control	32	Pretest	0.102	Normal
		Posttest	0.200	Normal

Based on Table 4, the outputs of the pretest-posttest of normality tests for critical thinking skills of the experimental and class of controles obtained a significance worth of > 0.05, so it can be seen that the data is normally distributed. Furthermore, a homogeneity test was carried out to find out if the population variance was the same or different from the criterion, if the significance was > 0.05, then the sample was taken from a homogeneous population and the data was obtained in Table 5.

Table 5: Outputs of Pretest-Posttest Worth Homogeneity Test for critical thinking skills

Levene Statistics	Df1	Df2	Sig.
0.145	1	70	0.704

Based on Table 5, the outputs of the homogeneity test for the Pretest-Posttest worth of the critical thinking skills of the control and class of experimental of controles obtained a significance worth of 0.704 which was > 0.05, so it can be seen that the sample came from a homogeneous population.

Next, test the hypothesis with the independent sample-t test. The outputs of the hypothesis testing of students' critical thinking skills in the class of control and class of experimental can be seen in Table 6:

Table 6: Outputs of the Students' Critical Thinking Ability t-test

Variable	N	Signification		Conclusion
		Sig (2-tailed)	5%	
Critical Thinking Ability	32	0.000	0.05	There are significant differences

Based on Table 6, a significance worth of 0.000 is obtained. Because the sig (2-tailed) worth is 0.000 <0.05, then Ha is accepted and Ho is rejected. It can be concluded that there is a significant difference between the critical thinking abilities of students who take the inquiry model studying using Instagram media and the critical thinking skills of students who take the inquiry model studying using Power Point media.

Next, the N-Gain test is to find out the increase in students' critical thinking skills based on the Pretest-Posttest score data. The test outputs are presented in Table 7.

Table 7: N-Gain Test Outputs for Students' Critical Thinking Ability

Class	Score	N-Gains
Experiment	Min	0.63
	max	1.00
	$\bar{x}$	0.82
Control	Min	0.52
	max	0.90
	$\bar{x}$	0.71

Based on Table 7, it can know that the mean N-Gain worth in the class experimental is 0.82 with minimum worth of 0.63 and maximum worth of 1.00, while the mean worth in the class of control is 0.71 with a minimum worth of 0.52 and the maximum worth is 0.90 which indicates that the N-Gain worth in class of experimental is higher than class of control. This means that there is an increase in students' critical thinking which is higher in classes that use inquiry studying models with Instagram media compared to classes that use inquiry studying models with Power Point media. This happens because students who take part in studying in the class of experimental are given a change to be directly involved in studying activities using Instagram media. so that students are motivated to learn and have high curiosity. This encourages students to improve critical thinking ability in studying process.

The outputs of above research are appropriate with the research conducted by Salamudin & Amelia (2022) which states that increasing students' ability of critical thinking can be achieved by inquiry studying model. This is also reinforced by research conducted by Prasetiyo & Rosy (2020) which explains that studying with the inquiry model can make students able to understand the material well, play an active role in studying, and improve students' critical thinking skills. The same thing was also expressed by (Mustaricha, 2019) in his research which showed that the physical and mental activities of students were able to increase enthusiasm, concentration and students' critical thinking skills.

Improving critical thinking skills cannot be separated from the active role of students in studying. Studying material is not given directly, but students seek and find their own subject matter by completing several stages in the inquiry model presented in the Student Worksheet. In the process, it can develop the ability to think scientifically and curiosity about a phenomenon. The stages of studying with the inquiry model start from orientation and formulate problems, then how do students answer questions through the formulation of hypotheses which must then be proven by observation and continued by testing the truth of the hypothesis to make conclusions (Amijaya et al., 2018).

The proces studying that occurs in the class experimental using the inquiry studying with Instagram media is very effective. Students are very enthusiastic in participating in studying. Students are also able to complete each stage in the LKPD with the help of Instagram media and find their own concepts through the outputs of discussions or exchanging ideas with other students. This is due to the role of Instagram media in the inquiry studying model which increases students' interest and attention, so that the reaction rate material is followed very well.

In the class of control, the studying process was quite effective, but there were 3 students who were less enthusiastic about the studying process. This can be seen during the group discussion process, the student in question is playing and talking with his friend so that the discussion in his group does not occur as expected. This caused by the lower, attention and readiness of students in studying.

Conclusion

There is an effect of using Instagram media in inquiry learning on improving critical thinking skills and student learning motivation on reaction rate material. The use of Instagram media in the inquiry learning model can improve students' critical thinking skills and learning motivation in reaction rate material. The utilization of Instagram media in the inquiry learning process makes students more motivated to learn, have curiosity, thus encouraging students to have critical thinking skills. This is because the material presented in Instagram is accompanied by photos and videos as well as features that attract students' interest and enthusiasm in learning chemistry, especially reaction rate material.

Suggestion

Along with the development of technological advances, especially in the world of education, making innovations in education also needs attention. With the existence of research

on the use of Instagram social media in chemistry learning, especially the reaction rate material, it is hoped that in further research the use of Instagram social media can continue to be developed in other chemical materials.

References

Amijaya, L. S., Ramdani, A., & Merta, I. W. (2018). Pengaruh Model Pembelajaran Inkuiri Terbimbing terhadap Hasil Belajar dan Kemampuan Berpikir Kritis Peserta Didik. Jurnal Pijar Mipa, 13(2), 94–99. https://doi.org/10.29303/jpm.v13i2.468

Amiruddin, A., Supriadi, N., & Suherman, S. (2021). Motivasi Belajar: Dampak Komik Matematika Bernuansa Islami Berbantuan Instagram. EQUALS: Jurnal Ilmiah Pendidikan Matematika, 4(1), 42–49. https://doi.org/10.46918/equals.v4i1.935

Amnawati, B. (2022). Upaya Meningkatkan Motivasi Belajar Peserta Didik Di KElas X TPP PAda MAteri Pergerakan Nasional Dengan Memanfaatkan Instagram. EDUCATOR : Jurnal Inovasi Tenaga Pendidik dan Kependidikan, 2(1), 72–83. https://doi.org/10.51878/educator.v2i1.1095

Ariza Rahmadana Hidayati, Wirawan Fadly, & Rahmi Faradisya Ekapti. (2021). Analisis Keterampilan Berpikir Kritis Siswa pada Pembelajaran IPA Materi Bioteknologi. Jurnal Tadris IPA Indonesia, 1(1), 34–48. https://doi.org/10.21154/jtii.v1i1.68

Facione, P. A. (2015). Critical Thinking: What It Is and Why It Counts. Critical Thinking, 1–30.

Firdausy, S., Rokhim, D. A., & Widarti, H. R. (2020). Application of Contextual Teaching And Learning (CTL) Model to Improve Learning Outcomes and Critical Thinking Ability in Redox and Electrochemical Material for Class XII SMA. Jurnal Pendidikan Dan Pembelajaran Kimia, 9(3), 79–93. https://doi.org/10.23960/jppk.v9.i3.202008

Mukmainah, S. A. (2020). Penerapan Model Pembelajaran Inkuiri Terbimbing Untuk Meningkatkan Keterampilan Berpikir Kritis Peserta Didik Pada Materi Laju Reaksi Di SMAN 1 Rengel. Journal of Chemistry Education, 9(1), 133–139.

Mustaricha, M. (2019). Efektivitas Model Pembelajaran Inkuiri Dalam Meningkatkan Kemampuan Berpikir Kritis Siswa Pada Mata Pelajaran Pendidikan Pancasila Dan Kewarganegaraan. Jurnal Ilmiah Pendidikan Pancasila dan Kewarganegaraan, 4(2), 368–373. http://journal2.um.ac.id/index.php/jppk

Peraturan Menteri Pendidikan Nasional No. 26. (2006). Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 23 Tentang Standar Kompetensi Lulusan Untuk Satuan Pendidikan Dasar Dan Menengah.

Prasetiyo, M. B., & Rosy, B. (2020). Model Pembelajaran Inkuiri Sebagai Strategi Mengembangkan Kemampuan Berpikir Kritis Siswa. Jurnal Pendidikan Administrasi Perkantoran (JPAP), 9(1), 109–120. https://doi.org/10.26740/jpap.v9n1.p109-120

Rachmawati, D., & Rohaeti, E. (2018). Pengaruh Model Pembelajaran Sains, Teknologi, dan Masyarakat Terhadap Kemampuan Berpikir Kritis dan Motivasi Belajar Peserta Didik. Jurnal Pendidikan Matematika dan Sains, 6(1), 29–39. http://journal.uny.ac.id/index.php/jpms

Rohim, Ali Muhammad, Y., Dwi & Yulianti, Dwi. (2020). Unnes Physics Education Journal. Unnes Physics Education Journal, 9(2), 149–157. http://journal.unnes.ac.id/sju/index.php/upej

Rokhim, D. A., Atikah, A., Vitarisma, I. Y., Rahayu, S., & Muntholib, M. (2023). Assessment of High School Students' Ability to Solve Structured Problems with Ideal Model on Acid-Base. Orbital: The Electronic Journal of Chemistry, 276–284. https://doi.org/10.17807/orbital.v14i4.16294

Rokhim, D. A., Widarti, H. R., & Fajaroh, F. (2020). Pengembangan Bahan Belajar Flipbook Pada Materi Redoks dan Elektrokimia Berbasis Pendekatan STEM-PjBL Berbantuan Vidio Pembelajaran. Kwangsan: Jurnal Teknologi Pendidikan, 8(2), 234. https://doi.org/10.31800/jtp.kw.v8n2.p234--250

Rokhim, D. A., Widarti, H. R., Munzil, M., & Zakia, N. (2022). Application of Instagram Social Media to Qualitative Analysis Materials for Groups I and II to Increase Student Interest in Learning. Jurnal Penelitian Pendidikan IPA, 8(6), 3055–3062. https://doi.org/10.29303/jppipa.v8i6.2446

Rosmanah, Y. (2021). Peningkatan Motivasi Belajar Bahasa Inggris Materi Caption Menggunakan Media Instagram Siswa Kelas XII IPA 4 SMA NEGERI 1 Dawarblandong Mojokerto Tahun Pelajaran 2020/2021. Jurnal Inovasi Pendidikan Bahasa dan Sastra, 1(1), 43–50. https://doi.org/10.51878/language.v1i1.379

Salamudin, C., & Amelia, E. M. (2022). Pengaruh Penerapan Model Pembelajaran Inkuiri Sosial Pada Mata Pelajaran Pendidikan Agama Islam Terhadap Kemampuan Berpikir Kritis Siswa Di SMAN 14 Garut. Jurnal Masagi, 01(01), 1–7. www.journal.stai-musaddadiyah.ac.id

Seran, M. V. L., Ain, N., & Sundaygara, C. (2019). Pengaruh Model Pembelajaran Inkuiri Terbimbing terhadap Motivasi Belajar dan Kemampuan Berpikir Kritis Siswa SMPN 02 Wagir. Seminar Nasional FST, 2, 439–446.

Suarsini, N., Wesnawa, I., & Kertih, I. (2020). Pengembangan Media Pembelajaran Geografi Berbasis Media Sosial Instagram untuk Peningkatan Motivasi dan Hasil Belajar Siswa. Jurnal Pendidikan IPS Indonesia, 4(2), 72–81. https://doi.org/10.23887/pips.v4i2.3386

Widarti, H. R., Sriwahyuni, T., Rokhim, D. A., & Syafrudin, A. B. (2023). Social media-based learning in Chemistry learning: A review. Eclética Química, 48(2).

Widiasrumana, H. C. (2017). Penerapan Metode Eksperimen Untuk Meningkatkan Motivasi Belajar, Nilai Karakter, Dan Pengetahuan Siswa Kelas VIII SMP Negeri 6 Wonogiri Pada Materi Gaya Gesek. UNIVERSITAS SANATA DHARMA.

Widyasari, S. F., Masykur, R., & Sugiharta, I. (2021). Flipped Classroom: Peningkatan Kemampuan Berpikir Kritis Matematis Dan Motivasi Belajar Peserta Didik Madrasah. Journal of Mathematics Education and Science, 4(1), 15–22. https://doi.org/10.32665/james.v4i1.171

Wijaya, T. (2022). Efektivitas Strategi Inkuiri Dalam Meningkatkan Kemampuan Berpikir Kritis dan Motivasi Belajar Siswa Pada Pembelajaran Tematik KElas IV MI Sunan Kalijogo Karangbesuki Malang. Universitas Islam Negeri Maulana Malik Ibrahim Malang.