Meta-Analysis: Inquiry-Based Learning Model in Improving Student Academic Achievement

Ade Fitri Rahmadani[1], Syafrijon[2*], Nizwardi Jalinus[3], Ridwan[4], Rijal Abdullah[5], Nurhasan Syah[6]
adefitri.rahmadani@bunghatta.ac.id, syafrijon@ft.unp.ac.id, nizwardi@ft.unp.ac.id, ridwanftunp@gmail.com, rijal_a@ft.unp.ac.id, nurhasan@ft.unp.ac.id
Universitas Bung Hatta[1], Universitas Negeri Padang[2,3,4,5,6]

Article Information	Abstract
	The purpose of this study is to re-analyze the application of inquiry learning models to improve student academic achievement. Meta-analysis is the type of research in this article. The research stage begins with formulating research problems, the next stage is continued by analyzing research data in accordance with the inquiry learning model. In the process of data collection apply non-test techniques wheresearching for articles contained in electronic journals using the Google Scholar site. 25 scientific articles were obtained from various articles both national and international found based on the inquiry model. In accordance with the results of data analysis, it was obtained that in applying the inquiry learning model in the learning process, there was an increase in student academic achievement. This is evidenced by the lowest value data obtained with a percentage of 3.05% to the highest value with a percentage of 50.99% so that an average of 17.66% is obtained. Then based on the calculation of the effect size of 25 articles used as references, the average effect size value of 7.33% was obtained. From this effect size value, it can be seen that the influence of the inquiry learning model has a very high influence on increasing student academic achievement.

A. Introduction

The progress of a nation can be seen based on how the application of education that has been carried out at the unit level of education. The quality of education can be improved based on the educational process that will be carried out. In the process of implementing primary and secondary education based on the applicable curriculum that learning has been student-centered so that the learning process can be motivating, fun, collaborative, inspiring, providing opportunities for students to be creative based on interests, talents and also the physical and psychological development of students this is in accordance with what is stated in. Based on this, of course, it will make education a means for students to improve their intelligence and cultivate them into a complete person. The future of a nation is one of the main keys determined by the implementation of education involving teachers and students. Of course, to realize the goals of national education, the role of schools is very important. School is a place that is able to condition how the educational process can be carried out by the way students easily receive subject matter, of course, with a sense of comfort so that the goals expected by a teacher can be achieved. The teacher is the spearhead so that the learning process can be carried out effectively so that the learning provided can be useful and useful for students. The fact found from several opinions that state that in taking formal education is only considered as a formality learning to form Indonesian human resources. Of course, this is only focused on the implementation of education from basic education to higher education which aims to be recognized in the community. From this opinion, no one cares about the process so as to get the results of formal learning that has been carried out [1].

A professional teacher is someone who has responsibilities with the main task is to educate, guide, teach, direct, train, assess and evaluate the students he teaches both in formal education and non-formal education. Of course, a teacher must have competence in terms of designing learning programs, and also be able to organize and know classroom management so that students can carry out learning and be able to reach the level of maturity which is the last goal in the learning process [2]. In improving the quality of educational results, of course, it is greatly influenced by the professionalism of a teacher and teacher performance in the learning process that involves students in an educational way which means continuing and developing life values, teaching with the meaning of continuing and developing science and technology, the last is to train it by developing the skills that exist in students [3].

In carrying out the learning process many factors affect the performance of a teacher. According to him, factors that affect the kinejra of a teacher are peer support, motivation will get recognition as a form of self-actualization, inability to master technology and telecommunications, lack of attending trainings to support independence and creativity in developing learning media. Some other factors that affect the performance of a teacher according to are the level of teacher education, work climate, facilities and infrastructure, teacher mentality, leadership style of the principal, teacher welfare guarantees and managerial abilities of the principal. To minimize factors that affect the performance of a teacher, of course, the preparation of creative and innovative teaching materials. In terms of delivering teaching materials, of course, a teacher must also increase knowledge about teaching

methods and media used in the learning process. In the educational process, of course, teachers are required so that the goals of a learning are achieved as evidenced by improving student learning outcomes. This is certainly related to how the strategy, effort and effort of a teacher in providing learning material to students through the use of learning models in order to carry out an effective learning process [4].

Teachers are the key to success in the learning process. A school can produce a superior student who is the contribution of a professional teacher at work. In this case, there is a relationship that occurs between teachers and students in managing a good learning process in order to achieve good quality graduates from a school. The role of the teacher has a very important role and can not be replaced in the learning process. In line with that [5], [6], in addition to having knowledge and skills in carrying out teaching and learning activities, a teacher must also have creativity in determining or choosing learning methods that are tailored to the conditions of students or their learning environment.

In the process of delivering learning material, a teacher must be able to create friendly and interesting learning environment conditions and also when delivering learning material must be based on existing facts, not just assumptions. The teaching method used must also be able to provide direct experience to students, encourage active learning, and give students the freedom to research a problem independently. In addition, to achieve the objectives of inquiry learning in improving student learning outcomes, teachers must guide, train, and adapt students to be competent and able to think critically and then act scientifically at each stage of applying the inquiry learning model. In addition to improving the cognitive side of students, the inquiry learning model must also be able to improve affective aspects in students by fostering moral formation and beliefs and changing attitudes and values. The psychomotor aspect is inseparable from the assessment process in this learning model. For students to successfully master cognitive, affective, and psychomotor abilities, the three domains must be integrated as a whole. According to him, the learning process is an interaction between teachers and students, as well as between students and other learning resources that aim to enable students to obtain information, skills and form a positive attitude in learning. For this reason, the learning process will be more meaningful if it is carried out in a comfortable environment and uses the right learning model [7].

With inquiry-based learning, students act as learning subjects with the hope that students are able to analyze, categorize, and respond to subject matter and receive the instructions given. When using inquiry as a teaching and learning approach, students have an important role in shaping the environment and paradigm of inquiry learning in addition to being a learning topic. Each student is encouraged to actively participate in the teaching and learning process on this model. One way to do this is to actively ask thoughtful questions about each material presented. According to him, because every student has the opportunity to answer questions, teachers are not always required to give answers. In the application of the inquiry learning model students must be involved a lot in the learning process, then the inquiry learning model is a type of student-oriented learning, or a student-centered approach. It is expected that by doing questions based on certain statements or descriptions, students' understanding will increase [8].

The inquiry learning model is one type of teaching that provides opportunities for students to explore their own knowledge and play an active role in their education in order to gain conceptual understanding and critical thinking skills. Inquiry learning requires students to be able to find their own knowledge so that in the learning process students can be actively involved. With inquiry-based learning, teachers act as facilitators and motivators, placing students at the center of the learning process. Nevertheless, teachers will still provide support and direction to students who are experiencing difficulties [7].

According to [9], states that the inquiry learning model has several principles, namely the principle of developing students' intellectuals, the principle of active involvement in the learning process, the principle of how to communicate and the principle of information openness and way of thinking. According to, there are several types of inquiry learning models that can be applied, namely independent inquiry, controlled inquiry, planned inquiry and guided inquiry. Freedom in inquiry learning is a form of model that adapts to the learning style of each student where each student has his own learning style, but the teacher still provides boundaries and rules for the student's learning style. Meanwhile, according to him, through the inquiry learning method, the process carried out is active learning where there is feedback both between teachers and students, or between students and students who discuss a learning material. In shaping the mindset of students, teachers are expected to collaborate with students in formulating problems to be solved, followed by students will prove from the correctness of the concepts carried out by conducting experiments and observations simply which will later be used as conclusions that will be determined by students in solving a problem. From the activities carried out in understanding a material, it will certainly increase understanding in students [10], [11].

Although the focus of inquiry learning is student activities, inquiry strategies are a series of learning activities that make full use of students' abilities for systematic search and inquiry as well as critical, logical, and analytical thinking. This allows students to formulate their own discoveries with full confidence. However, teachers still play an important role in the creation of learning experiences. They are required to lead students in carrying out activities, facilitate and supervise student learning activities, correct mistakes made by students, and continue to provide direction and guidance to students when encountering difficulties. Students turn their educational experience into something useful for real life. Students become accustomed to creative, analytical, and critical problem-solving processes on their own, whether the teacher provides assistance or not. Students will find learning more meaningful and retain the knowledge gained if they do it themselves by first seeing, testing it, then putting it into practice. Because the child will act on what he sees, pay attention to what he hears, and understand what he does.

There are several stages of the inquiry learning approach that will be followed. Students will be aware of the difficulties they will solve later if the problem is identified and clarified in the first step. Students will first identify the problem they are going to solve before formulating short-term predictions or hypotheses that they will later verify through data analysis. The data collection step was completed as a tool for use in the previous data analysis phase. Data analysis is the next step, when the collected information is examined to see if the developed hypothesis can be

accepted or rejected. Teachers need help in data analysis so that students know what to do, such as grouping data. The final stage is to draw conclusions, from which it can be determined whether or not the theory of each group is accepted.

So it can be known that the inquiry learning model involves students actively both mentally and physically in solving problems set by the teacher, then this model emphasizes students to be more actively involved in their education. Students can investigate or find a problem based on facts to obtain data, and the role of the teacher in this process is limited to being a facilitator and guide. To instill in students the qualities of a scientific scientist: thoroughness, perseverance, tenacity, objectivity, honesty, creativity, and respect for the point of view of others.

Learning objectives shape almost all actions or behaviors of individuals. According to [12], the learning outcomes achieved by students can be used to measure how well the learning process goes. Thus, learning outcomes can be understood as a sign that a child has achieved learning goals if he has achieved learning outcomes, so that it can cause behavioral changes in students. Learning produces behavioral shifts that lead to abilities; This effect may be the main result of teaching or a secondary effect.

Learning outcomes or evaluation of the learning process carried out and outlined in test questions related to a topic, is a measure of how effective the process of implementing learning activities runs. This indicates that students are able to answer questions correctly. According to learning outcomes are the results of learning activities that cause changes in knowledge (cognitive), attitudes (affective), and behavior (psychomotor) dynamically, continuously, and observably. In any topic, achieving high learning outcomes during the learning process is crucial [13].

The skills that a student possesses after his or her educational experience are known as learning outcomes. Students will receive a learning outcome at the end of the learning process. In the learning process, learning outcomes are very decisive. Learning outcomes are the main objectives of learning activities. The extent to which students can absorb and understand the content taught is determined by looking at their learning outcomes. As the end product of the learning process, learning outcomes have the power to convey information and affect change in students. One of the objectives of the learning activities that have been carried out is the modification of the learning outcomes achieved. In accordance with the assessment of that the skills that students have after their educational experience are known as learning outcomes. Students will receive a learning outcome at the end of the learning process. In the learning process, learning outcomes are very decisive. Learning outcomes are the main objectives of learning activities. The extent to which students can absorb and understand the content taught is determined by looking at their learning outcomes. As the end product of the learning process, learning outcomes have the power to convey information and affect change in students. One of the objectives of the learning activities that have been carried out is the modification of the learning outcomes achieved. Learning outcomes are the results of learning activities in the form of consequences [14].

The learning strategy chosen by the teacher will determine student learning outcomes. Teachers need to be aware of the basics of learning that takes place in the classroom. According to [15] that changes in one's behavior are essentially the result of experience, in this case it is the result of student learning. All aspects can be

determined in determining learning outcomes both in terms of affective, cognitive and psychomotor domains all covered in the learning process. In addition, in determining aspects of the cognitive realm teachers must look based on knowledge abilities, comprehension, namely understanding, explaining and summarizing, application, analysis, organizing, planning and evaluating. From the affective / attitudinal realm must reflect how the attitude of accepting, responding, and the characteristics of a person. While the psychomotor realm consists of the application of a technique or skill in a discussion. So in this study will be reanalyzed how the use of inquiry learning models that have been implemented in the learning process to improve student academic achievement [2].

B. Research Method

The methodology of this study used meta-analysis research. A meta-analysis is a type of study that applies a certain amount of data from past research. Meta-analysis is an analysis of quantitative data contained in the results of previous research to be used in decision making of a hypothesis contained in the study. The technique in collecting data using non-test techniques is that researchers search for articles in electronic journals through the Google Scholar site by affixing keywords to inquiry learning models and increasing student academic achievement. Based on the search conducted, 25 articles were obtained that have been published in accordance with the study material. In the data analysis technique, researchers use quantitative data comparison models in order to obtain how much impact the inquiry learning model has in the teaching and learning process which is seen based on student academic achievement. The results of quantitative data based on the articles that have been obtained are then used to compare the difference between the value score of learning outcomes before treatment is carried out by applying the learning model with after treatment using the inquiry learning model. After that, the value is sought in percentage form by dividing the number of scores before and after treatment using an inquiry learning model to obtain an increase in student academic achievement [16].

C. Result and Discussion

Utilizing an inquiry-based learning model to improve student academic achievement can be seen based on research data from 25 articles that are referenced by researchers. The data that has been obtained from the article is processed using a summary model and establishes conclusions drawn from research findings using inquiry learning models in the learning process. Next, the results of the data obtained are reported with qualitative and quantitative descriptive models. In table 1 can be seen the results of research analysis that applies the inquiry learning model.

Table 1. Results of Percentage Increase in Student Academic Achievement

No	Improved Learning Outcomes		
	After	Before	G
1	61.77	50.46	11.31
2	75.55	62.85	12.7
3	85.25	68.15	17.1
4	86.13	35.14	50.99
5	77.8	63.2	14.6

No	Improved Learning Outcomes		
	After	Before	G
6	86.32	68.16	18.16
7	80.29	53.24	27.05
8	88.46	63.65	24.81
9	83	71	12
10	84.88	77.48	7.4
11	78.29	59.51	18.78
12	71.6	53.2	18.4
13	76.9	73.85	3.05
14	81.65	70	11.65
15	87.41	68.89	18.52
16	81.31	54.26	27.05
17	83	69	14
18	82.5	72.22	10.28
19	83.21	74.66	8.55
20	90.91	60.61	30.3
21	85.17	70.1	15.07
22	91.93	66.67	25.26
23	84	59.59	24.41
24	85.03	77.22	7.81
25	80.55	68.2	12.35
Mean	82.12	64.45	17.66

From table 1, findings based on the results of research conducted show an increase in student achievement by applying an inquiry learning model. For the average percentage value of increasing learning outcomes using the inquiry learning model, the lowest data was 3.05%, while the highest percentage was 50.99%, so that if averaged from the overall data, a value of 17.66% was obtained. The average score before applying the inquiry learning model was 64.45% after being given treatment by applying the model, there was an increase with a percentage result of 82.12%.

To find out the truth of the data collected, a normality test is carried out to find out whether the data is in the normal distribution category or not. For data analysis here assisted by SPSS application version 26. The results of processed normality data are presented in table 2 below:

Table 2. Results of Statistical Analysis of Data Normality Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		25
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	6.02152642
Most Extreme Differences	Absolute	.120
	Positive	.081
	Negative	-.120
Test Statistic		.120
Asymp. Sig. (2-tailed)		.200[c,d]

It is known that the residual value is normally distributed because the significance value determined through the normality test is 0.200 > 0.05. In the next stage, paired sample test analysis is carried out to see t data between learning outcomes data before and learning outcomes after the results are obtained in table 3 below:

Table 3. Paired Sample Test

| | Paired Differences | | | | | t | Df | Sig. (2-tailed) |
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
				Lower	Upper			
Before - After	-17.664	9.892	1.978	-21.747	-13.581	-8.928	24	.000

In this study, two hypotheses can be assumed, namely by applying the results of the hypothesis test where, Ho is that there is no significant difference between the results of student academic achievement before and after using the inquiry learning model while the H1 hypothesis is that there is a significant difference between student learning outcomes before and after using the inquiry learning model.

In the table above shows that the result of t count is -8.928 < ttable 1.714, then the conclusion H0 is not accepted. It was concluded that there was a significant difference between student learning outcomes before applying the inquiry learning model and after using the inquiry learning model. The next step we analyze the difference test is shown in the following table 4:

Table 4. Paired Sample Statistics
Statistics

		Before	After
N	Valid	25	25
	Missing	0	0
Mean		64.45	82.12
Std. Error of Mean		1.939	1.260
Std. Deviation		9.697	6.299

When viewed based on the mean score value on student learning outcomes before and after using the inquiry learning model, there was a difference or increase, namely before applying this model, the average student learning outcome was 64.45, while after students applied the inquiry learning model, an average score of 82.12 was obtained.So if we look at the average results, using the inquiry learning model has a positive influence on improving student learning outcomes.

Effect size analysis is also carried out so that it can be known which categories of inquiry learning models are able to affect student learning outcomes. The effect size category can be seen in the following table:

Table 5. Effect *Size Criteria*

Range	Criterion
$d < 0.2$	Low
$0.2 < d < 0.8$	Keep

d > 0.8	Tall

In determining how much effect (effect size) / d type is done the following calculation:

$$d = \frac{82.12 - 64.45}{\frac{\sqrt{9.69^2 + 6.29^2}}{25 - 2}} = 7.33$$

It can be seen that from the value d obtained, which is 7.33, it means that the value is greater than 1.45 and is in the very high category. So it can be interpreted that the application of the inquiry learning model has a very high influence in improving student learning outcomes. From the results of the data analysis, it can be concluded that there is an influence in applying the inquiry learning model in improving student academic achievement. This is in accordance with the opinion of the results of the study [17], which turns out that in applying an inquiry learning model it turns out to affect student learning outcomes. Where there is an increase in learning outcomes from students who are given inquiry learning model treatment.

One of the factors used in improving student learning activities is through the selection of learning models that are applied in the teaching and learning process. According to [18] him, in the teaching and learning process there is actually no learning model that can be right in various conditions, so in having a learning model that will be applied by a teacher, of course, you must consider the state of student conditions, subject matter, teaching materials used, supporting infrastructure and of course how the condition of the teacher who will apply the model.

Among the existing learning models, the inquiry learning model can be used as a reference for teachers to actively involve students to find and find problems or concepts independently to be understood in the learning process so that it has an impact on learning outcomes. According to [19] him, the inkuri learning model will involve the activeness of both teachers and students so that in learning activities there will be activeness in developing understanding of the material discussed. In line with this in research [20], in applying the inquiry learning model will be effectively implemented if the teacher can provide explanations to students to be able to find and find solutions to a problem to be discussed. Also strengthened by opinions, model inquiry can actually make it easier for students to identify a problem conceptually and accompany students to be able to conceptualize in sequence how to find ways to overcome the problems they encounter [10].

From the results of 25 studies that have been conducted on inquiry learning models, it can be seen that the results of research conducted on learning outcomes have unequal value between one article and another. The difference in research results based on the analysis that has been done can be known many factors that affect it both caused by external factors and internal factors. , states that the learning environment can affect student learning outcomes based on the completeness of learning tools, the learning model used by teachers, how cooperation between students in discussing a learning material, and school discipline. From the factors of the learning environment can have an influence on the implementation of learning. According to research conducted by [21], [3], there are many factors that influence students in learning, namely infrastructure factors, social environment factors whether school, community or family, motivation and interest in learning, attitudes

and intelligence. It can be concluded that both internal and external factors can affect a person's learning process.

D. Conclusion

The results of a meta-analysis of the application of inquiry learning models that have been carried out on research that has been carried out from previous researchers turned out to be one of the models that can be applied by teachers in improving student learning outcomes. Of the 25 articles on the inquiry learning model, it can improve student learning outcomes from the lowest data is 3.05% to the highest data acquisition of 50.99% with the average produced is 17.66%. From the results of the effect size calculation carried out on 25 articles discussing the inquiry learning model, the results were obtained at 7.33. Based on the acquisition of the effect size, it is known that the inquiry learning model has a very high influence in improving student learning outcomes.

E. References

[1] Peraturan Menteri, "Peraturan Menteri Koordinator Bidang Pembangunan Manusia dan Kebudayaan Nomor 6 Tahun 2022," 2022.

[2] J. Suprihatiningrum, "Guru Profesional: Pedoman Kinerja," *Kualifikasi & Kompetensi Guru, Yogyakarta: Ar-Ruzz Media*, 2014.

[3] E. Nasri, T. Heri Setiawan, H. Warianto, and P. Studi Matematika, "FAKTOR-FAKTOR YANG MEMPENGARUHI RENDAHNYA PRESTASI BELAJAR UJIAN MATEMATIKA SISWA DENGAN MENGGUNAKAN METODE ANALISIS FAKTOR," vol. 3, no. 1, 2022, doi: 10.46306/lb.v3i1.

[4] Y. Kamijan, "Faktor Internal Dan Faktor Eksternalterhadap Kinerja Guru Di Masa Pandemi Covid-19," *Jurnal Ekonomi Manajemen Sistem Informasi*, vol. 2, no. 5, pp. 630–638, 2021.

[5] S. Nurkhasanah, "Penerapan Model Pembelajaran Inkuiri untuk Meningkatan Aktifitas Belajar Siswa pada Mata Pelajaran Ilmu Pengetahuan Alam Kelas IX. A SMP Negeri 1 Gangga," *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, vol. 5, no. 1, pp. 47–53, 2019.

[6] K. W. A. Siahaan, S. T. P. Lumbangaol, J. Marbun, A. D. Nainggolan, J. M. Ritonga, and D. P. Barus, "Pengaruh Model Pembelajaran Inkuiri Terbimbing dengan Multi Representasi terhadap Keterampilan Proses Sains dan Penguasaan Konsep IPA," *Jurnal Basicedu*, vol. 5, no. 1, pp. 195–205, Nov. 2020, doi: 10.31004/basicedu.v5i1.614.

[7] M. Fahmi and S. Wiguna, "Efektivitas Model Pembelajaran Inquiry Learning Dalam Meningkatkan Pemahaman Siswa Pada Mata Pelajaran Fiqih Kelas X MAS Ar-Rahman Bubun."

[8] U. YUNIARTI, "PENERAPAN MODEL PEMBELAJARAN INKUIRI TERBIMBING DALAM MENINGKATKAN HASIL BELAJAR KIMIA PADA MATERI ASAM BASA SISWA KELAS XI MIPA MAN 1 TUBAN," *Journal of Education and Learning Sciences*, vol. 2, no. 2, Oct. 2022, doi: 10.56404/jels.v2i2.29.

[9]   L. Putu Eka Marhaeni Wraswati, "Penerapan Model Pembelajaran Inquiri Terbimbing Sebagai Upaya Meningkatkan Prestasi Belajar Matematika Siswa SMP," 2020.

[10]   A. S. Tamalene and I. Wilujeng, "Keefektifan Model Inquiry Training dalam Pembelajaran IPA untuk Meningkatkan Hasil Belajar Siswa SMP Negeri 1 Kota Ternate," 2022.

[11]   G. Sujana, "Meningkatkan Hasil Belajar IPA Melalui Penerapan Metode Inkuiri Terbimbing," *Journal of Education Action Research*, vol. 4, no. 4, pp. 514–521, 2020, [Online]. Available: https://ejournal.undiksha.ac.id/index.php/JEAR/index

[12]   E. Wairata, "Penerapan Metode Belajar Inkuiri untuk Meningkatkan Hasil Belajar Pkn Materi Pokok Nilai-Nilai Pancasila dalam Kerangka Praktik Penyelenggaraan Pemerintahan Negara," *Journal of Education Action Research*, vol. 5, no. 3, pp. 392–397, 2021, [Online]. Available: https://ejournal.undiksha.ac.id/index.php/JEAR/index

[13]   M. Sarumaha, D. Harefa, and K. Kunci, "NDRUMI: Jurnal Pendidikan dan Humaniora MODEL PEMBELAJARAN INQUIRY TERBIMBING TERHADAP HASIL BELAJAR IPA TERPADU SISWA," vol. 5, [Online]. Available: https://jurnal.uniraya.ac.id/index.php/NDRUMI

[14]   H. Juhdy, "Penerapan Metode Pembelajaran Berbasis Inquiry untuk Meningkatkan Prestasi Belajar Siswa pada Mata Pelajaran Kimia Materi Termokimia: Perubahan Entalpi di Kelas XI IPA-1 Semester I SMAN 1 Palibelo Tahun Pelajaran 2019/2020," *Jurnal Pendidikan dan Pembelajaran Indonesia (JPPI)*, vol. 2, no. 2, pp. 46–62, Oct. 2022, doi: 10.53299/jppi.v2i2.221.

[15]   A. Aureola Dywan, G. Septian Airlanda, U. Kristen Satya Wacana, and J. Tengah, "EFEKTIVITAS MODEL PEMBELAJARAN PROJECT BASED LEARNING BERBASIS STEM DAN TIDAK BERBASIS STEM TERHADAP KETERAMPILAN BERPIKIR KRITIS SISWA," 2020. [Online]. Available: https://jbasic.org/index.php/basicedu

[16]   H. Retnawati, E. Apino, D. H. Kartianom, and R. D. Anazifa, "Pengantar Meta Analisis (Yogyakarta." Parama Publishing, 2018.

[17]   L. Junaidi *et al.*, "PENGARUH MODEL PEMBELAJARAN INKUIRI TERHADAP HASIL BELAJAR PADA MATERI BUBUT DASAR SISWA KELAS X TPM SMK NEGERI 1 PALANGKA RAYA," 2020.

[18]   Fathurrohman, "model-model-pembelajaran," 2015.

[19]   N. M. B. Mulyanti, I. K. Gading, and Diki, "Dampak Penerapan Model Pembelajaran Inkuiri Terbimbing terhadap Hasil Belajar IPA dan Kemampuan Berpikir Kritis Siswa," *Jurnal Ilmiah Pendidikan Profesi Guru*, vol. 6, no. 1, pp. 109–119, Mar. 2023, doi: 10.23887/jippg.v6i1.59276.

[20]   A. Tohir and A. Mashari, "Efektivitas Model Pembelajaran Inkuiri dalam Meningkatkan Hasil Belajar Siswa Kelas IV SDN 27 Tegineneng," *Jurnal Ilmiah Sekolah Dasar*, vol. 4, no. 1, pp. 48–53, 2020.

[21]   dkk Yuli Susilawati, "astuti,+1497+Yuli+Susilawati_192165057+11390-11398," 2023.