



The Effect of Problem-Based Learning in Islamic Religious Education on Students' Critical Thinking Skills

Hapni Laila Siregar

Universitas Negeri Medan, Sumatera Utara, Indonesia

Nurmayani

Universitas Negeri Medan, Sumatera Utara, Indonesia

Email: hapnilaila@unimed.ac.id

Abstract

Critical thinking is one of the skills that students need to master in this 21st century because as individual students will of course face various problems in their lives. These critical thinking skills include the skills to identify, select, evaluate, organize problems, and find solutions appropriately and logically. This research was conducted in several departments at Medan State University. This research aims to analyze the effectiveness of the problem-based PAI learning model in improving students' critical thinking skills. This research uses descriptive quantitative methods. The data collection technique uses observation and questionnaires. Meanwhile, the data analysis technique uses the Mann-Whitney test. This research produces findings: the problem-based PAI learning model is effective in improving students' critical thinking skills. This can be seen from the results of the Mann Whitney test where the value of $A_{symp. (2-tailed)} < \alpha$ then H_0 is rejected and H_a is accepted, meaning there is a significant difference between the critical thinking abilities of students who apply the problem-based PAI learning model and the critical thinking abilities of students who apply other learning models.

Keywords: *Critical thinking skills, Islamic Religious Education, Problem-based learning*

Introduction

Critical thinking skills are skills that everyone must have in the 21st century (Priatna et al., 2020), especially in order to be able to face various problems in social and personal life (Nuryanti et al., 2018). Critical thinking skills include the ability to access, analyze, synthesize information that can be learned, trained and mastered (Ibrahim et al., 2021; Maričić & Špijunović, 2015). The critical thinking skills of Indonesian students are currently still relatively low (Farib et al., 2019; Lestari & Annizar, 2020; Marudut et al., 2020). This can be seen from the results of the Program for International Student Assessment (PISA, 2018), where Indonesia's literacy score is 382, ranking 64th out of 65 countries. The facts in the field are that students still have difficulty solving problems related to critical thinking (Anugraheni, 2020), such as defining mathematical problems, selecting relevant information to solve problems, developing and selecting relevant hypotheses, and drawing conclusions from problems. The large number of cases involving students currently also shows the lack of students' ability to deal with problems appropriately and logically. A recent case is the murder committed by a student from one of the major campuses in Jakarta against his underclassmen in August 2023. The perpetrator is entangled in online loans and therefore the perpetrator wants to control the victim's belongings so he is desperate to

kill him. This case on the one hand is a reflection for us of how short the perpetrator's way of thinking is in overcoming his problem. His lack of critical thinking skills causes the perpetrator to take bad shortcuts which in the end only bring great harm both to the victim and his family and to the perpetrator himself who has clearly lost his future.

The ability to think critically and solve problems appropriately and logically is very important for students to master (Rosy & Pahlevi, 2015) because as a human being, students are certainly inseparable from various life problems, both problems originating from within themselves, as well as problems in the family, community, environment and nation. However, it should be understood that the ability to think critically and solve problems appropriately and logically cannot develop by itself along with human physical development. Critical thinking skills can develop if given the right training and stimulus.

Higher education has a strategic role in building students' critical thinking skills through various courses in higher education, one of which is the Islamic Religious Education (PAI) course. Islamic Religious Education is a course that aims to increase students' faith, understanding, appreciation and practice of Islam to become muslim people who believe and fear Allah SWT and have a noble character in personal, social, national and state life (H. L. Siregar et al., 2020; Umami et al., 2019). As for the learning aspect, Islamic Religious Education is oriented to form a complete muslim person, develop all human physical and spiritual potential, and foster a harmonious relationship between each individual with Allah, humans, and the universe. To be able to achieve this goal, the learning of Islamic Religious Education must be able to present the deepest meaning within students. If we look at PAI learning in universities today, it appears that PAI lecturers have not fully developed students' critical thinking skills (Laila Siregar, 2024). This can be seen from lecturers devoting more attention to cognitive development (religious knowledge) of students, PAI learning is limited to memorization and understanding (Dian et al., 2023; Mulyana, 2018; H. Siregar et al., 2022), still indoctrination (Nuruddin, 2017) and the implementation of PAI has not fully developed strong rational thinking skills and independence (H. L. Siregar & Ramli, 2020; Tan, 2014). Based on all the explanations above, it is clear that the development of critical thinking and problem-solving skills is still neglected in PAI courses.

One alternative solution to this problem is to apply an innovative learning model that can improve critical thinking skills. The Problem Based Learning model is a learning model that can hone students' critical thinking skills (Satwika et al., 2018; Wynn et al., 2014). Problem-based learning is a learning model that requires students to learn problems based on predetermined planning and principles and at the same time have the skills to solve problems (Murniati & Hermawan, 2018). PBL helps students to improve thinking skills and problem-solving skills, learn adult roles and become independent learners. PBL is student-centered learning (Snyder & Wiles, 2015). This research is an effort to analyze the extent to which the problem-based PAI learning model is effective in building students' critical thinking skills such as the skills to identify problems, select and evaluate problems, organize problems, and find solutions to these problems appropriately and logically.

Methods

This research includes quantitative descriptive research. There are previous research stages that have been carried out before entering this research stage, namely (1) preliminary study. Based on theoretical studies and preliminary research results, a PAI learning model design has been prepared which is assumed to be able to develop

students' critical thinking skills, namely a problem-based PAI learning model; (2) Model development. After the model design was completed, a Forum Group Discussion (FGD) was held involving several experts to validate the learning model design that had been completed previously. Furthermore, revisions and improvements to the model were carried out based on suggestions and input from experts. (3) Experimental studies. The model is practiced and analyzed to see the extent of development of students' critical thinking abilities after implementing the model. This article is an explanation of the third stage of research carried out, namely testing an experimental model in the field (experimental study).

This research was conducted in several departments at Medan State University in the even semester of the 2023-2024 Academic Year. When implementing the model, this study involved 157 students from the Department of PTIK, Nutrition Science, Chemistry Education, Mathematics Education and Economics Education. For the control class, there were as many as 145 students from the Department of Computer Science, Building Engineering Education, Physics Education, Chemistry Education and Accountancy Education. The data collection technique of this study was questionnaire and observation. As for analyzing the data, this study was carried out the Mann Whitney test. All quantitative data in this study were processed with SPSS version 22 facility. In this study, students' critical thinking skills were measured referring to indicators of critical thinking skills shown in table 1 below:

Table 1. Critical Thinking Indicators

Critical Thinking Ability Indicators	Identify and formulate problems
	Explain the problem by making appropriate definitions and distinguishing between facts and assumptions
	Collect and compile relevant information related to the problem.
	Formulate explanations and possible problem solutions
	Analyze and evaluate existing problem solving
	Analyze the problem from an Islamic point of view
	Choose one or more appropriate and logical problem solvers
	Making conclusions and arguments

Finding and Discussion

After the hypothetical model, namely the problem-based PAI learning model, is formed, the next stage is to implement the hypothetical model in PAI learning. At the end of the lesson, a questionnaire is given to students to get an idea of students' critical thinking skills after learning is complete. The descriptive statistics regarding the critical thinking skills of students who apply the problem-based PAI learning model and students who do not apply the problem-based PAI learning model can be seen in the tables below:

Data Normality Test

This normality test is performed using the Kolmogorof-Smirnov Test. The data test is normally distributed if the Asymp Sig (2-tailed) value produced is greater than the alpha value, which is 0.05 (5%). The results of the normality test of this research data can be seen in table 2 below:

Table 2. Data Normality Test Results

		Tests of Normality					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Kemampuan Berpikir Kritis	Kelas Eksperimen	.088	157	.004	.964	157	.000
	Kelas Kontrol	.169	145	.000	.925	145	.000

a. Lilliefors Significance Correction

From table 2 above, it can be seen that the experimental class and control class have Asymp Sig values smaller than 0.05 so that the data used in this study are abnormally distributed. Because the two classes are abnormally distributed, the Mann Whitney test is performed.

Mann Whitney Test

The Mann Whitney test is used to test the mean difference of two groups of mutually free samples if one or both sample groups are not normally distributed (Sundayana, 2014). The results of the Mann Whitney test can be seen in table 3 below:

Table 3. Mann Whitney Test Results

Ranks				
	Kelas	N	Mean Rank	Sum of Ranks
Kemampuan Berpikir Kritis	Kelas Eksperimen	157	194.27	30501.00
	Kelas Kontrol	145	105.19	15252.00
	Total	302		

Test Statistics ^a	
	Kemampuan Berpikir Kritis
Mann-Whitney U	4667.000
Wilcoxon W	15252.000
Z	-8.865
Asymp. Sig. (2-tailed)	.000

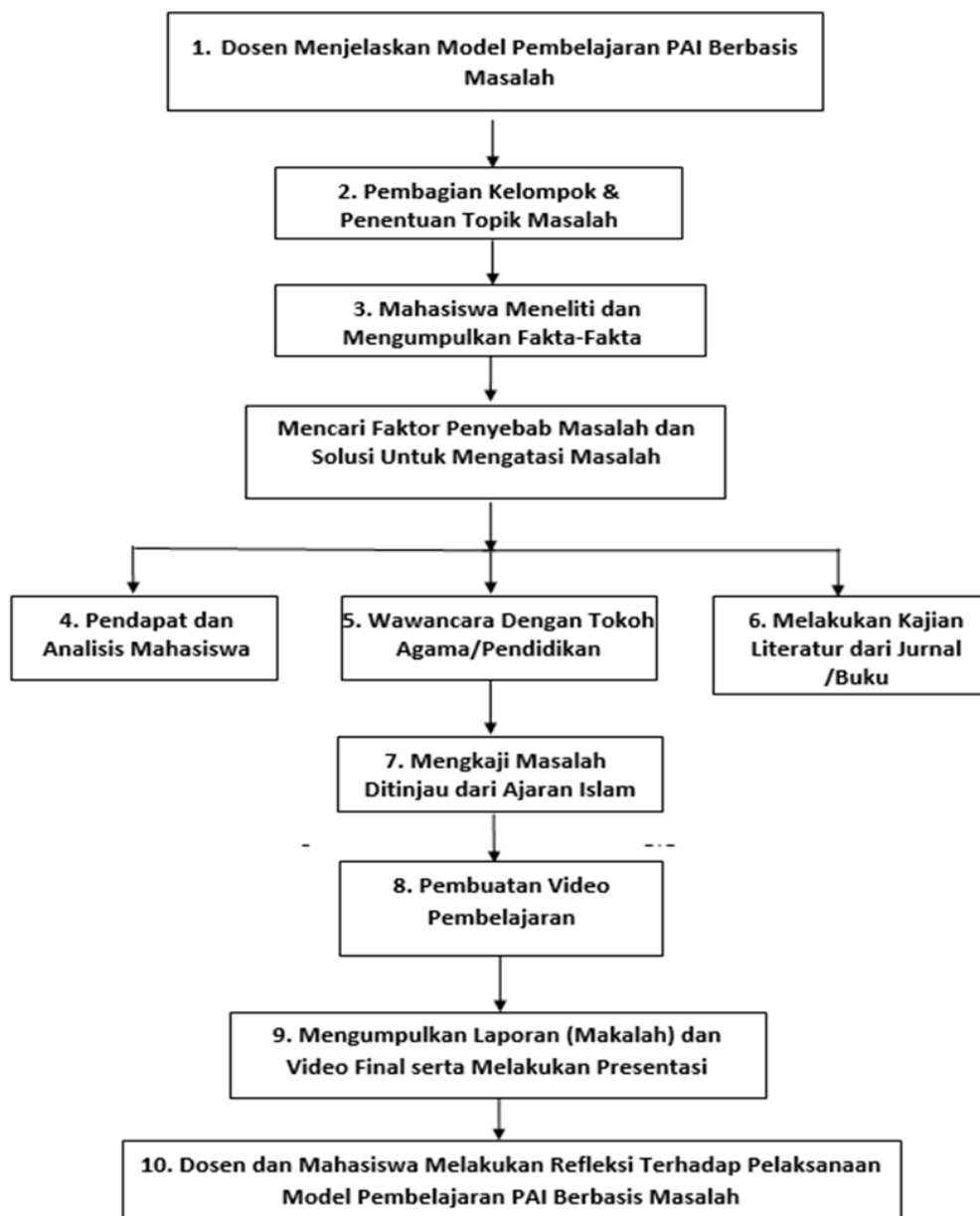
a. Grouping Variable: Kelas

Based on the output table of the "Mann Whitney Test" above, it can be seen that the Asymp Sig. (2-tailed) value is $0.000 < 0.05$, then as the basis for decision making in the Mann Whitney Ho test is rejected and Ha is accepted, which means that there is a significant difference between the critical thinking ability of students who apply the problem-based PAI learning model and the critical thinking ability of students who apply other learning models.

Development of a Problem-Based PAI Learning Model

A model is a set of sequential procedures or conceptual framework as a guide for realizing an activity process by showing the main elements and structure (Tibahary & Muliana, 2018). A learning model is a pattern that has been planned as well as possible in preparing curriculum, materials and programs, implementing learning, building care, and stimulating learning interactions between students and building knowledge, values, competencies and skills (Joice, 2016). The problem-based PAI

learning model developed in this research means a learning model where students identify, analyze and solve real problems they encounter in their environment as a basis for acquiring knowledge and concepts through critical thinking and problem-solving skills. In this learning model, students are trained to identify and analyze real problems around them so that they are able to produce precise and logical considerations and solutions. In developing this problem-based PAI learning model, lecturers prepare in advance the learning tools needed such as learning syntax, teaching materials and learning media as well as evaluation instruments. All of these learning tools are very necessary so that the learning objectives of increasing students' critical thinking skills can be achieved optimally. Below is the syntax of the problem-based PAI learning model.



Picture 1. Syntax of The Problem-Based PAI Learning Model

In the learning syntax above, it can be seen that there are 10 steps in this problem-based PAI learning model. In the introduction, 1. Lecturers explain to students about the problem-based PAI learning model, including its understanding, background and benefits, as well as critical thinking skills developed in this learning model; 2. The lecturer divides students into several groups, each group consisting of 4-6 students, followed by discussions to determine the topic of the problem to be discussed and solved by each group; 3. Students conduct literature reviews and collect various facts related to the problem. With it students understand the problem more deeply. The next step is to look for the factors causing the problem and find solutions to overcome the problem. In this section, there are three steps taken by students, namely step 4. Students provide their opinions and analyses individually about the factors that cause problems to arise and also solutions to solve them; step 5. Students conduct interviews with community leaders/religious leaders/educational leaders about the factors that cause problems and solutions; step 6. Students conduct literature reviews from journals and books to find factors that cause problems and also solutions to overcome them; 7. Students study the problems raised in terms of Islamic teachings; 8. Students pour all the steps they have taken in this problem-based PAI learning into an interesting and informative learning video; Step 9. After the learning video is finished, students collect the report (paper) and final video and present it in front of the class. The last step, lecturers and students reflect and clarify the values of the problem-based PAI learning model that have been carried out.

Effectiveness of the Problem-Based PAI Learning Model in developing students' critical thinking skills

The development of students' critical thinking skills in PAI learning is something that is very possible to do because critical thinking skills are abilities that can be trained. In developing this problem-based PAI learning model, lecturers first see and understand the characteristics of students, so that the model developed is in accordance with the way of thinking of students who have developed far. Lecturers also pay attention to several other things in developing this learning model, including: 1. Teachers do not position themselves as the only learning resources in charge of conveying information, but as managers of learning resources. 2. Learning is not just memorizing information, memorizing formulas, but how to use information and knowledge to hone critical thinking skills. 3. Students are no longer considered as objects, but as learning subjects who must seek and construct their own knowledge (Kristanto & Susilo, 2015).

After implementing this problem-based PAI learning model in several experimental classes, various benefits and positive things were found, including: creating a PAI learning process that is not just a transfer of information from lecturers to students but to a learning process that constructs knowledge based on understanding and experience gained by students both individually and in groups. In this problem-based PAI learning model, the role of lecturers will also be more diverse. Lecturers are no longer just about conveying information to students but rather dealing with strategies to help students achieve learning goals. This learning model is also collaborative so that the ability to communicate and cooperate among students will be built. In addition, because the problems identified, analyzed, and solved by students are real problems that are close to student life, it is hoped that in the future students will be able to solve their own problems appropriately and logically, and furthermore

students will be able to become problem solvers, namely being able to contribute actively to solving real problems in society (H. L. Siregar, 2018).

From the effectiveness test of the model conducted, namely the Mann Whitney test, it was found that the application of the problem-based PAI learning model had a significant effect on students' critical thinking skills. If we pay attention to the steps (syntax) of the problem-based PAI learning model that has been shown above, it can be seen that in each stage students are trained to have critical thinking skills. First, students identify and formulate real problems around them, this is intended so that the learning is contextual. Furthermore, students deepen their understanding of the problem by making definitions and distinguishing between facts and assumptions. After that, students explore information related to the factors causing the emergence of the problem and find solutions. In digging up information about these causal factors and solutions, students take it from three things, namely 1. The student's own opinion; 2. conduct interviews with community leaders/education experts; 3 Conduct literature reviews both from books and journals. A very important next step, students analyze the problem from an Islamic point of view. After all the information is obtained, students then analyze all the data carefully, then choose the most appropriate and logical problem solving. For the final step, students create a learning video that contains all the steps they take in this problem-based PAI learning model. In the closing step, lecturers and students make conclusions and arguments.

From the syntax above, it is clear that each step in this problem-based PAI learning model builds students' critical thinking skills. As for classes that do not apply the problem-based PAI learning model, of course, at every stage of learning they do not train students to think critically. From the results of the questionnaire given to the control class, it was found that 35% of respondents stated that students' understanding and ability to analyze real problems around them was still low. Poor results were also seen in students' understanding and analysis of the factors causing social problems around them, where as many as 37% of respondents were still low.

The results of this research are in line with research conducted by Ulger (Ulger, 2018) which also produced data that the PBL model can be applied to train critical thinking skills. Increasing critical thinking skills in students with this PBL model can be explained as follows. First, the students in this study were in their late teens, at which time students' intellectual, moral and thought development had already developed considerably (cognitively). Students in these characteristics are suitable if they are given a learning model that stimulates thinking models with problems, cases, and problem-solving discussions as found in the PBL model (Wynn et al., 2014). Second, related to the role of the lecturer, in this PBL learning model the lecturer acts as a facilitator so that students play an active role in the learning process. In research by Wynn Sr et al. (2014) explained that the learning atmosphere in this PBL model is more lively because during the learning process students are required to be active both in thinking and in expressing the results of their thoughts so that student involvement and collaboration are also high. This is also what can be observed in this research, that after the lecturer uses the PBL model, student responses and also the lecture atmosphere become more conducive where students always think and move actively, thereby supporting increased critical thinking skills. If we look at the learning theory, the PBL model is actually what is also highly recommended, namely learning that is able to activate students, which involves multiple senses and even involves doing things. The more active the students are, the more interesting and meaningful the learning will be in the students' hearts.

The effectiveness of the problem-based PAI learning model in improving students' critical thinking skills is also in line with the results of several previous studies which say that problem-based learning (PBL) can improve critical thinking skills (Bachtiar, 2014; Mulyanto et al., 2018). Of course, the effectiveness of the implementation of this problem-based PAI learning model depends on the availability of the learning tools needed. For this reason, before implementing this problem-based PAI learning model in the field, lecturers have first prepared the learning tools needed, including teaching materials, model implementation steps, problem solving schedules and assessment/ evaluation instruments for both individual students and groups. This is intended so that the implementation of this problem-based PAI learning model becomes directed, easy and fast.

Based on the findings above, developing a PBL model in PAI courses is very appropriate. Viewed from the context of improving the quality of education, the PBL model is a learning strategy that teachers can use to develop students' abilities in dealing with problems, because so far this ability has received little attention. As a result, when students are faced with difficult problems, they are overwhelmed in solving them and it is not uncommon for students to become so desperate that they take shortcuts, for example consuming illegal drugs or committing suicide as a result of the problems they face.

Viewed from the psychological aspect, PBL learning relies on cognitive psychology which starts from the assumption that learning is a process of changing behavior due to meaningful experiences. Through this process, students will little by little develop as a whole. This means that student development does not only occur in the cognitive aspect but this also occurs in the effective and psychomotor aspects (Rusman, 2016).

Viewed from a philosophical aspect, related to the function of the school as an arena or forum for preparing students to live in society, with the implementation of PBL, students will be ready to face any problems in their lives and this is very important because facing problems is an inevitability that cannot be avoided by every human being. Therefore, the exercises given to students regarding problem solving will train them to think critically and systematically in dealing with problems and solving them.

Conclusions

The problem-based PAI learning model is a learning model where students identify, analyze and solve real problems they encounter in their environment as a basis for acquiring knowledge and concepts through critical thinking and problem-solving skills. In this learning model, students are trained to identify and analyze real problems around them so that they are able to produce precise and logical considerations and solutions. The results of this research, the problem-based PAI learning model can improve students' critical thinking skills. This can be seen from the significant difference between the critical thinking skills of students who apply the problem-based PAI learning model and students who do not apply the problem-based PAI learning model. The use of this problem-based PAI learning model makes students able to understand real problems well, and are able to provide solutions creatively, precisely and logically.

For the effectiveness of the implementation of the problem-based PAI learning model, lecturers need to prepare all the learning tools needed. These include learning syntax, teaching materials, learning media, problem solving schedules and assessment/evaluation instruments. For the smooth implementation of this problem-

based learning model in PAI lectures, it is highly recommended to carry out training and workshops for PAI lecturers, especially for those who have never applied it in the learning process.

References

- Anugraheni, I. (2020). Analisis Kesulitan Mahasiswa dalam Menumbuhkan Berpikir Kritis Melalui Pemecahan Masalah. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, 4(1), 261–267. <https://doi.org/10.31004/cendekia.v4i1.197>
- Bachtiar, S. (2014). Upgrades critical thinking and cognitive learning outcomes through problem based learning (PBL) model in material excretion systems IX grade students in junior high school. *National Conference: Empowering the 21st Century*.
- Dian, D., Indayanti, A. N., Irfan Fanani, A., & Nurhayati, E. (2023). Optimizing Islamic Religious Colleges In Facing The Era of Globalization. *Tafkir: Interdisciplinary Journal of Islamic Education*, 4(1), 58–77. <https://doi.org/10.31538/tijie.v4i1.326>
- Farib, P. M., Ikhsan, M., & Subianto, M. (2019). Proses berpikir kritis matematis siswa sekolah menengah pertama melalui discovery learning. *Jurnal Riset Pendidikan Matematika*, 6(1), 99–117. <https://doi.org/10.21831/jrpm.v6i1.21396>
- Ibrahim, I., Sujadi, I., Maarif, S., & Widodo, S. A. (2021). Increasing Mathematical Critical Thinking Skills Using Advocacy Learning with Mathematical Problem Solving. *Jurnal Didaktik Matematika*, 8(1), 1–14. <https://doi.org/10.24815/jdm.v8i1.19200>
- Joice, B. W. M. dan C. E. (2016). *Models of Teaching (Model-Model Pengajaran)*. Pustaka Pelajar.
- Kristanto, Y., & Susilo, H. (2015). Pengaruh Model Pembelajaran Inkuiri Terbimbing terhadap Kemampuan Berpikir Kritis dan Hasil Belajar IPA Siswa Kelas VII SMP. *Jurnal Pendidikan Dan Pembelajaran Universitas Negeri Malang*, 22(2), 197–208.
- Laila Siregar, H. (2024). Analisis Pengembangan Kemampuan Berpikir Kritis Mahasiswa Dalam Mata Kuliah Pendidikan Agama Islam. *IHSAN : Jurnal Pendidikan Islam*, 2(2), 134–150. <https://doi.org/10.61104/ihsan.v2i2.194>
- Lestari, A. C., & Annizar, A. M. (2020). Proses Berpikir Kritis Siswa dalam Menyelesaikan Masalah PISA Ditinjau dari Kemampuan Berpikir Komputasi. *Jurnal Kiprah*, 8(1), 46–55. <https://doi.org/10.31629/kiprah.v8i1.2063>
- Maričić, S., & Špijunović, K. (2015). Developing Critical Thinking in Elementary Mathematics Education through a Suitable Selection of Content and Overall Student Performance. *Procedia - Social and Behavioral Sciences*, 180, 653–659. <https://doi.org/10.1016/j.sbspro.2015.02.174>
- Marudut, M. R. H., Bachtiar, I. G., Kadir, K., & Iasha, V. (2020). Peningkatan Kemampuan Berpikir Kritis dalam Pembelajaran IPA melalui Pendekatan

- Keterampilan Proses. *Jurnal Basicedu*, 4(3), 577–585.
<https://doi.org/10.31004/basicedu.v4i3.401>
- Mulyana, R. (2013). *Model pembelajaran nilai melalui pendidikan agama Islam*. Saadah Pustaka Mandiri.
- Mulyanto, H., Gunarhadi, G., & Indriayu, M. (2018). The Effect of Problem Based Learning Model on Student Mathematics Learning Outcomes Viewed from Critical Thinking Skills. *International Journal of Educational Research Review*, 3(2), 37–45. <https://doi.org/10.24331/ijere.408454>
- Murniati, A., & Hermawan, A. (2018). E-Problem Based Learning (E-PBL) Pada Mata Kuliah Akuntansi Manajemen Sebagai Alternatif Pembelajaran Inovatif. *Jurnal Ilmiah Bisnis Dan Ekonomi Asia*, 11(1), 1–10.
<https://doi.org/10.32812/jibeka.v11i1.25>
- Nuruddin. (2017). Merumuskan Strategi Pembelajaran Nilai (Keagamaan) Dalam Pendidikan Islam. *EDUKASI: Jurnal Penelitian Pendidikan Agama Dan Keagamaan*, 5(1), 55–73. <https://doi.org/10.32729/edukasi.v5i1.275>
- Nuryanti, L., Zubaidah, S., & Diantoro, M. (2018). *Analisis Kemampuan Berpikir Kritis Siswa SMP*.
- PISA. (2018). *ASSESSMENT AND ANALYTICAL FRAMEWORK*. © OECD 2019 . <https://doi.org/10.1787/acd78851-en>
- Priatna, N., Lorenzia, S. A., & Widodo, S. A. (2020). STEM education at junior high school mathematics course for improving the mathematical critical thinking skills. *Journal for the Education of Gifted Young Scientists*, 8(3), 1173–1184.
<https://doi.org/10.17478/JEGYS.728209>
- Rosy, B., & Pahlevi, T. (2015). Penerapan problem based learning untuk meningkatkan kemampuan berpikir kritis dan keterampilan memecahkan masalah. *In Prosiding Seminar Nasional*, 160, 160–175.
- Rusman. (2016). *Mode-Model Pembelajaran Mengembangkan Profesionalisme Guru*. PT Raja Grafindo Persada.
- Satwika, Y. W., Laksmiwati, H., & Khoirunnisa, R. N. (2018). Penerapan Model Problem Based Learning untuk Meningkatkan Kemampuan Berfikir Kritis Mahasiswa. *Jurnal Pendidikan (Teori Dan Praktik)*, 3(1), 7–12.
<https://doi.org/10.26740/jp.v3n1.p7-12>
- Siregar, H. L. (2018). *INTEGRASI SAINS DAN ISLAM DALAM PEMBELAJARAN PENDIDIKAN AGAMA ISLAM (Vol. 2)*.
<http://semnasfis.unimed.ac.id2549-435X>
- Siregar, H. L., & Ramli. (2020). Development of Integrated Character Education Models in PAI Learning at University. *Ta'dib: Jurnal Pendidikan Islam*, 9(1), 116–129.

- Siregar, H. L., Syihabuddin, Hakam, K. A., & Komalasari, K. (2020). Application of project based learning (PJBL) inislamic religious education courses (an alternative solution to the problem of learning PAI at PTU). *Journal of Critical Reviews*, 7(1), 21–28. <https://doi.org/10.22159/jcr.07.01.05>
- Siregar, H., Nurmayani, N., & Kurniawati, E. (2022, July 27). *Analysis of Competence Development of the 21st Century in Islamic Religious Education Subject*. <https://doi.org/10.4108/eai.25-11-2021.2318822>
- Snyder, J. J., & Wiles, J. R. (2015). Peer led team learning in introductory biology: Effects on peer leader critical thinking skills. *PLoS ONE*, 10(1). <https://doi.org/10.1371/journal.pone.0115084>
- Sundayana, R. (2014). *Statistika Penelitian Pendidikan*. Alfabeta.
- Tan, C. (2014). *Islamic Education and Indoctrination*. Routledge.
- Tibahary, A. R., & Muliana. (2018). Model-Model Pembelajaran Inovatif. In *Scolae: Journal of Pedagogy* (Vol. 1, Issue 1).
- Ulger, K. (2018). The Effect of Problem-Based Learning on the Creative Thinking and Critical Thinking Disposition of Students in Visual Arts Education. *Interdisciplinary Journal of Problem-Based Learning*, 12(1). <https://doi.org/10.7771/1541-5015.1649>
- Umami, I., Gani, A., & Waskito, T. (2019). Proposal of Character and Moral Education for Gifted Young Scientists in Indonesia. *Journal for the Education of Gifted Young Scientists*, 7(2), 377–387. <https://doi.org/10.17478/jegys.579560>
- Wynn, C., Mosholder, R., & Larsen, C. (2014). Measuring the Effects of Problem-Based Learning on the Development of Postformal Thinking Skills and Engagement of First-Year Learning Community Students. *Learning Communities Research and Practice*, 2, Article 4.