

Analysis of junior high school students' questions based on bloom's revised taxonomy in terms of gender and school achievement level

Syahwa Adila Gepsi, Supurwoko, Febriani Sarwendah Asri Nugraheni*

Science Education, Faculty of Teacher Training and Education, Sebelas Maret University, Surakarta, Indonesia

*Corresponding author, email: febrianisarwendahasri@staff.uns.ac.id

Article History

Received: 27 May 2024

Revised: 28 June 2024

Accepted: 30 June 2024

Keywords

student questions

gender differences

school achievement levels

Abstract

Active involvement of students in the learning process is needed to make it easier for students to understand science material and to increase student curiosity. One of the important abilities to be developed is the skill of asking questions by students. In this study, researchers analysed the quantity and quality of students' questions in terms of gender differences and school achievement levels. This study aims to determine the profile of student questions in terms of gender and school achievement level and to find out whether there is a relationship between the level of student questions with gender and the level of student questions with school achievement level. The population of this study was 3 junior high schools / MTs in Ngemplak District, Boyolali Regency. The sampling technique used was cluster random sampling. The data collection technique used observation technique. The data analysis technique was descriptive and correlation test. The results of descriptive data analysis showed that there were differences in the profile of questions asked by students of different genders and students from schools with different levels of achievement, both in terms of the number, level and indicators of questions. As seen from the correlation test results, a significance value of 0.470 was obtained; meaning that there is no significant relationship between the level of questions and gender. The results of the correlation test between the level of questions and the level of school achievement also showed that there was no significant relationship between the level of questions and the level of school achievement, with a significance value of 0.531. These results may occur due to several other factors outside of gender and school achievement level, including the school zoning system and different learning time factors that make the difference in the level of questions based on gender and school achievement level insignificant.

How to cite: Gepsi, S. A., Supurwoko, S., & Nugraheni, F. S. A. (2024). Analysis of junior high school students' questions based on bloom's revised taxonomy in terms of gender and school achievement level. *Innovations in Science Education and Practice*, 1(1). <https://doi.org/10.20961/isep.v1i1.1770>

1. Introduction

Science Learning focuses on hands-on experience to improve skills and explore concepts that students need. According to Fitria (2017) the process of learning science involves various abilities, such as the ability to systematically ask questions, find answers, understand answers, to evaluate answers to perfect questions about "what", "why", and "how" things related to natural phenomena or the surrounding nature that will be used in the environment and technology. The process of learning science can be initiated using asking questions as a process of exploring knowledge to find answers based on facts (Vale, 2013).

Salamah & Susiyawati's research (2022) it is known that grade VIII students in science subjects at the question level are still at a low level. However, in the research of Sriyati & Wahyu (2019) stated that students' questioning skills are dominated by the category of sufficient question quality. The difference in the quality of such questions is due to the different comprehension abilities of individuals.

Gender differences are closely related to differences in the way students think so that they can affect the quality of the questions asked. Differences in the composition of the brains of men and women can affect how the brain works in processing information and thinking, this certainly has an impact on the questioning skills between male and female students. According to Amin (2018) one

of the points of difference between men and women, namely in the structure of the brain. The brain structure of men and women have differences located in several parts, namely the corpus callosum, hypothalamus, inferior parietal lobe (lower parietal lobe), and hippocampus. Differences in brain makeup affect the way and style of each gender to run things, including learning (Amin, 2018). In addition, differences in the social interaction of men and women can also be a factor causing differences to occur.

The learning process at school can also affect students' questioning skills. The benchmark of whether or not the learning process that occurs can be seen from the quality of the school because a quality school will create a quality learning process as well (Hidayat, 2014). A quality learning process will make students' thinking develop. Therefore, the quality of questions asked by students can be used as a reference for the quality of the learning process that has taken place. The low quality of student questions can be used as evaluation material for teachers and schools to improve the learning process

The level of questions based on cognitive processes can be divided into several categories based on the level of Bloom taxonomy revised by Anderson & Krathwohl (2002), namely remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating (C6). Questions with categories C1 To C3 indicate low-level thinking ability, while questions with categories C4 To C6 indicate high-level thinking ability (Anderson & Krathwohl, 2002). The revised Bloom taxonomy is still used as a reference to The Graduate competency standard so that it is very familiar to teachers, making it easier for teachers to test the effectiveness of the actions given on the results of this study.

This study aims to determine the profile of students' questions in terms of gender and level of school achievement and to determine whether there is a relationship between the level of students' questions with gender and the level of students' questions with the level of school achievement. The reason researchers link it to gender is because gender factors are often ignored by educators when managing the learning process in the classroom, so the teaching and learning process has not been running effectively. Researchers also linked it to school achievement levels. Correlation analysis is intended as a means of evaluation of educators and schools if there is a relationship between the quality of the questions with the level of school achievement. So that the learning process can be pursued more effectively so that the depth of thinking of a student is more honed so as to make students ask more questions with a high level.

2. Method

The population in this study is all grade VIII students in three selected SMP/MTs in Ngemplak District, Boyolali regency with a sample of 160 Grade 8 students from selected SMP / MTs. The sampling technique used in this study is probability sampling technique. Data collection using observation techniques. Researchers use nonparticipant observation techniques, where researchers are not involved or do not participate in giving any action during data collection and no effect whatsoever (Sugiyono, 2013). Data collection was done by recording the various questions asked by Junior High School students during learning in one chapter of science learning materials in each school.

All questions asked by students related to learning during the observation, then used as research data. All questions that have been collected, further analyzed and classified. Data that has been analyzed and classified, then validated by science lecturers. Data that has been validated, then tabulated in percentage form. Calculate the percentage of each question level by using the formula :

$$\text{Percentage (\%)} = \frac{\text{Total of part}}{\text{Total amount}} \times 100\%$$

This research uses descriptive data analysis methods and correlation tests. The descriptive analysis method was used to explain, interpret, and inform the tabulation of data regarding the profile of questions asked by students. The correlation test method was used to determine the

relationship between the level of questions asked by students with gender and the level of questions asked by students with the level of school achievement. The data correlation test uses the Spearman rank test. There are 3 interpretations of the correlation analysis results in this spearman rank test, namely:

Seeing the significance of the relationship to see if there is a relationship between the variables being sought. The basis for decision making in the Spearman rank test is based on the significance of the relationship, namely:

- a. If the probability (Sig) Rank Spearman > 0.05 then not correlated
- b. If the probability (Sig) Rank Spearman <0.05 then correlated

Looking for the strength of the relationship to find out whether the relationship is moderate, strong or very strong. The guidelines for the strength of the relationship (Correlation Coefficient) are presented in Table 1.

Table 1. Level of Relationship Strength Based on Correlation Coefficient

Tingkat koefisien korelasi	Tingkat Korelasi
0.00-0.199	Very weak
0.20-0.399	Ground
0.40-0.599	Enough
0.60-0.799	Strong
0.80-1.000	Very strong

Looking at the direction of the relationship, the criteria to see the direction of the relationship can be seen from the results of the correlation coefficient with the following decisions :

- a. If the correlation coefficient is positive, it means the direction of the unidirectional relationship
- b. If the correlation coefficient is negative, it means that the direction of the relationship is not in the same direction

3. Results and Discussion

This study used three different schools in Ngeplak Sub-district, Boyolali Regency as data collection sites. Based on the observation results, the average ANBK results of the three schools were known, which were then named school A for schools with high achievement levels, school B for schools with medium achievement levels, and C for schools with low achievement levels.

3.1. Student Question Results by Gender

Questions asked by male and female students have different levels. The percentage level of male students' questions based on the revised Bloom's Taxonomy level is presented in the diagrams of Figures 1 and 2.

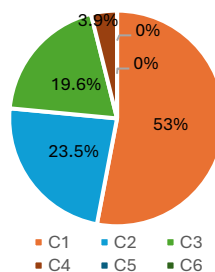


Figure 1. Percentage of Male Students' Question Rate

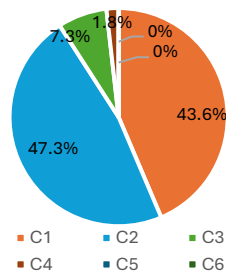


Figure 2. Percentage of Female Students' Question Rate

In addition to having different levels of questions, the questions asked by both male and female students also have different indicators. The following is the number of questions on each indicator asked by male and female students

Table 2. Total of Male and Female Students' Questions on each Indicator

Taxonomy Level	Indicator	Total Questions	
		Male	Female
C1 Remember	Recognizing	2	2
	Recalling	25	22
C2 Understand	2.1 Interpreting	0	1
	2.2 Exemplifying	2	3
	2.3 Classifying	4	3
	2.4 Summarizing	0	0
	2.5 Inferring	1	1
	2.6 Comparing	2	4
	2.7 Explaining	3	14
C3 Apply	3.1 Executing	3	1
	3.2 Implementing	7	3
C4 Analyze	4.1 Differentiating	0	1
	4.2 Attributing	0	0
	4.3 Organizing	2	0
C5 Evaluate	5.1 Checking	0	0
	5.2 Critiquing	0	0
C6 Create	6.1 Generating	0	0
	6.2 Planning	0	0
	6.3 Producing	0	0
Total		51	55

In general, the factors that influence the differences in the number and level of questions asked by male and female students can be divided into 2, namely biological factors and social factors. In terms of biological factors, a very close thing is the difference in brain structure. The brain structure of men and women has differences in the corpus callosum, hypothalamus, inferior parietal lobe, hippocampus.

Corpus callosum is a set of nerve cells that combine the two hemispheres of the brain. When listening to speech, the corpus callosum plays a role in sending auditory information from one hemisphere to the other (Goldstein et al., 2019). The bundle of nerves that connects the left-right brain (corpus callosum) of the male brain is a quarter smaller than the female brain. The distribution of information in the language center in women is more than men so that women are more fluent and

unlimited when speaking and can focus on more than one topic of conversation (Amin, 2018). Females speak more fluently so they ask more questions than male students.

Of the 6 classes used to collect data, 4 classes had more questions asked by female students. In addition, from the total number of questions asked, female students also asked more questions by asking 55 questions while male students only asked 51 questions.

The smaller corpus collosum will make men quickly concentrate on what they are doing, but at that time the ability to hear men will decrease so it is difficult to do many things at one time (Suyadi, 2018). Men will rarely ask questions and tend to focus more on what they are doing, for example when learning through practicum. Male students only focus on what they are doing and tend not to ask about the phenomena that occur during the practicum, while female students like to ask about things that happen during the practicum. Of the 8 questions that arose during practicum learning, male students only asked 1 question. So it is evident that male students only focus on what they are doing and rarely ask questions because it is difficult to do 2 jobs at a time.

The next part of the brain is the hypothalamus. The functions of the hypothalamus include controlling emotional responses and regulating daily behavior (Amin, 2018). The male hypothalamus is 2.5-3 times larger than the female (Amin, 2018). However, the hypothalamus in women contains more of the hormone serotonin, which makes women feel calmer, especially when communicating (Hadiyanto and Suyadi, 2023).

Male students who are more sensitive to stimulus will ask more questions related to direct implementation, namely questions at the C3 level. The ability of women who are calmer when communicating is one of the factors why the highest level of questions asked by women is at the C2 level with an indicator of explaining. Female students tend to ask questions that provoke a discussion to explain something. For example, when a female student asked "Why can vibrations occur?".

The next difference in brain structure is in the hippocampus. Hippocampus plays an important role for learning, memory, and spatial navigation (Anand & Dhikav, 2012). The hippocampus in the female brain is larger than in the male brain (Amin, 2018; Meifiani & Prasetyo, 2015). As a result, women can remember things in detail and longer, while men become more forgetful (Amin, 2018). Male students asked more C1 level questions with recall indicators compared to female students, for example when a male student asked "Are there also convex and concave lenses?". The ability to remember the type of lens should not be new because there are many examples of the application of these two types of lenses, for example the use of minus glasses which is the application of concave lenses.

Women's larger hippocampus allows them to ask more detailed questions about differences. An example is when female students ask "What is the difference between convex and concave mirrors?". Female students tend to ask about the details of the differences in the knowledge recorded in their memory.

Another part of the brain that distinguishes between men and women is the inferior parietal lobe which regulates visuospatial abilities and is needed for things related to mathematics and architecture (Imaniyati et al., 2024). The inferior parietal lobe in men is 6% larger and more symmetrical between the left and right lobes (Amin, 2018; Kurth & Luders, 2021). As a result, male students ask more questions at the C3 level on the implement indicator than female students, for example when male students ask "How much does a stone weigh when weighed in water?". In this question, the male imagination works by imagining the weight of the stone when it is in water and then implementing it into the appropriate formula.

Another factor that influences the number and level of questions asked by male and female students is social factors. According to the process, the form of social interaction is distinguished. The form of social interaction according to the process of occurrence can be in the form of cooperation, competition, and can even take the form of opposition or conflict (Soekanto, 2016).

From the observations made, male students rarely interact, male students only speak during the learning process if asked first by the teacher. Meanwhile, female students do more forms of

cooperative interaction. One form of female interaction is associative in the form of cooperation and agreement to achieve goals (Haqiqi et al., 2019). The dominant form of cooperation that occurs in women's social interactions is seen when they are working together to prepare activities (Puspita & Resdati, 2023). When doing practicum, female students are eager to help each other and exchange ideas with each other in order to achieve a goal, this is the reason why female students ask many questions at the C2 level with an indicator of explaining because it encourages discussion to occur during the learning process.

Based on the categorization of question levels, both genders still ask more low-level questions (C1-C3) than high-level questions (C4-C6). The C5 and C6 levels have not even emerged between the two genders. A possible influencing factor is that both male and female students are still unable to fully concentrate when learning takes place. Lack of concentration leads to low quality activities, so learning is less attentive which affects the ability to understand the material (Winata, I K., 2021). The quality of the teacher when providing stimulus and feedback is also still not good, and the lack of learning infrastructure can also be the reason why both genders cannot ask questions at the C5 and C6 levels.

3.2. The Correlation of Question Level to Gender

Table 3. Results of Correlation Tests Based on Gender

Sig. Value	Correlation Coefficient
0,470	-0,104

The results of the correlation test between question level and gender show that there is no significant relationship, the strength of the correlation is low, and the direction of the correlation is not unidirectional. Gender is not the only factor that influences students' learning process that affects the level of questions asked. There are other factors that can affect the learning process both from internal factors including physical factors, psychological factors, and fatigue factors and external factors including family factors, school factors, and community factors (Hapnita et al., 2018).

3.3. Results of Student Questions Based on School Achievement Levels

The questions asked by students in each school do not all cover levels C1 to C6. The percentage level of student questions in each school that have been analyzed based on the revised Bloom's Taxonomy level is presented in the diagram in Figure 3.

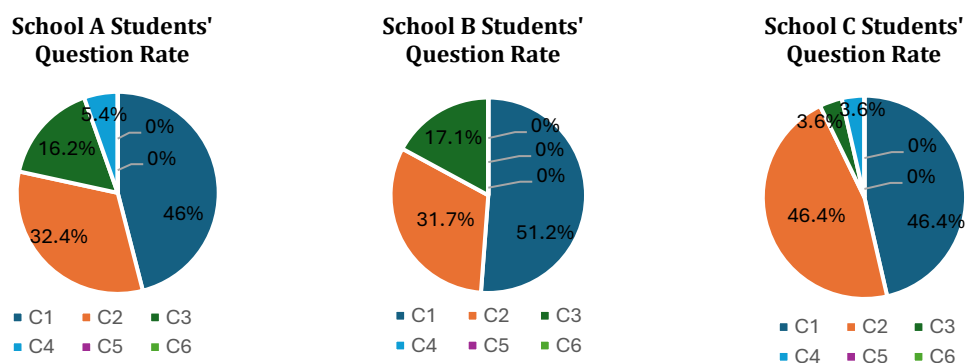


Figure 3. The percentage level of student questions

The questions asked by students in each school also have different indicators. The following is the number of questions on each indicator asked by students in schools A, B and C:

Table 4. Results of Question Indicator Analysis in Each School

Taxonomy Level	Indicator	Total Questions		
		A	B	C
C1 Remember	1.1 Recognizing	2	1	1
	1.2 Recalling	15	20	12

<i>C2 Understand</i>	<i>2.1 Interpreting</i>	1	0	0
	<i>2.2 Exemplifying</i>	2	1	2
	<i>2.3 Classifying</i>	1	6	0
	<i>2.4 Summarizing</i>	0	0	0
	<i>2.5 Inferring</i>	2	0	0
	<i>2.6 Comparing</i>	2	3	1
	<i>2.7 Explaining</i>	4	3	10
<i>C3 Apply</i>	<i>3.1 Executing</i>	0	4	0
	<i>3.2 Implementing</i>	6	3	1
<i>C4 Analyze</i>	<i>4.1 Differentiating</i>	0	0	1
	<i>4.2 Attributing</i>	0	0	0
	<i>4.3 Organizing</i>	2	0	0
<i>C5 Evaluate</i>	<i>5.1 Checking</i>	0	0	0
	<i>5.2 Critiquing</i>	0	0	0
<i>C6 Create</i>	<i>6.1 Generating</i>	0	0	0
	<i>6.2 Planning</i>	0	0	0
	<i>6.3 Producing</i>	0	0	0
Total		39	41	28

The level of school achievement is closely related to the learning environment. Sukmadinata (2015) says that the school environment includes the school's physical environment (facilities and infrastructure and learning resources), social environment (students' relationships with their peers, teachers and school staff), and academic environment (school atmosphere and teaching and learning implementation).

Judging from the physical environment of the school, school A and school B have more complete facilities and infrastructure and learning resources than school C. The function of facilities and infrastructure is to improve the quality of learning, create a socio-emotional climate and manage group processes (Megasari, 2014). School C has limited learning facilities and infrastructure, so teachers can only use makeshift teaching aids. Projector facilities also do not exist in this school, so teachers only rely on printed books in learning and cannot show videos or pictures. Video or movie media can develop imagination, clarify abstract things and provide a more realistic explanation (Atmaja, 2019). The absence of media limits the imagination of students and teachers in explaining things, so school C only raises questions at the C3 and C4 levels with 1 question each and raises more questions at the C1 and C2 levels which are low-level questions. Questions asked by students in school C usually arise when students do not understand the terms in the printed book, for example when students ask "What is an eyepiece?", the question appears twice in different classes. The reason for the emergence of these questions is the limited information related to the context being asked.

Then when viewed from the social environment, in schools A and B there is often a form of cooperative interaction between students and their friends, this can be seen during practicum or group discussions. During the group practicum at school A, students were seen helping each other among their group members and doing an equal division of tasks. In school B, one of the cooperative interactions was seen during group discussions, they actively exchanged opinions with their groupmates. While in school C, interactions between students were rare. They worked more individually, even when learning with group discussions. During group discussions, students in school C did not coordinate the division of tasks clearly, nor did they exchange ideas with each other.

Teacher interaction with students is also very influential on the learning process, this is related to the duties and role of the teacher as a learning leader who is positioned to be a communicator, so the teacher should be able to master good interaction patterns and communication techniques in the learning process (Inah, 2015). Teachers who always open question and answer sessions during the learning process can make the classroom atmosphere active and students can express their incomprehension through questions asked from what has been learned or material that has been

taught (Abnisa, 2024). In school C, the teacher's role as a trigger for interaction and communication in learning is less visible, the teacher lectures more and rarely opens question and answer sessions. In addition, school C teachers' feedback on questions asked by students was also less enthusiastic. Feedback given by teachers is very important because it gives students feedback on their progress and provides additional motivation to continue learning and improve their performance (Rahmiati & Aziz, 2023). So that learning in school C becomes very passive and students rarely ask questions.

Judging from the academic environment in the form of teaching and learning implementation. It is important for a teacher to manage learning that is more challenging and invites students to construct new knowledge through appropriate learning experiences so that students can think more deeply (Yuliati, 2017). School A applies varied learning methods which include lectures from the teacher, simple practicum in the classroom, group discussions and invites students to make observations and analysis both through pictures and learning videos, so that the learning process can run actively and create a deeper understanding by students. Deep understanding can create questions at the C4 level, for example when the teacher invites to discuss together about the picture of a hydraulic car lift, then the question arises by students "How can such a heavy car be lifted by just turning the tap?".

School B also conducts a varied learning process, one of which is by conducting a simple practicum. Practicum activities can form illustrations for concepts and principles through the process of generalization of facts observed in practicum activities (Suryaningsih, 2017). Practical learning makes students ask a lot of questions at the C3 level (Yanto & Zubair, 2022). For example, when students ask about "how is the process of formation of elements in nature?", the question is a C3 level question with indicators of running procedures.

C schools tend to use conventional learning methods with lectures by teachers. The sequence of activities carried out by students in conventional learning will make students not play an active role in learning, this results in students not really understanding a certain knowledge and their knowledge is just a rote for students (Nasution, 2017). Understanding that is not deep makes students unable to develop their thinking towards the application of concepts and analysis of information, so that in school C C3 and C4 level questions rarely appear. C3 level questions are low-level questions that demand answers in the form of applying knowledge to new situations and only appear once. C4 level questions are questions resulting from the analysis of information between sections.

From the data the results of the question level of students in schools A, B, and C comparison of low cognitive questions (level C1-C3) is still more than high cognitive (level C4-C6). The C5 and C6 level questions which are the higher level question types have also not appeared. Question C5 requires students to evaluate the information provided, while most students assume that the information provided by the teacher is the information that is definitely true so rarely or lazy to evaluate. Rusdiana et al. (2014) said that most learning practices so far foster a common perception in students where teachers are seen as people who are all-knowing, all-able, and all-right. Dependence of students on teachers is one of the factors that rarely causes the emergence of C5 question types. C6 requires students to build a general structure of information or specific concepts on an ongoing basis.

Another factor that makes students ask more questions at a low level is due to the student's study time during the day which causes the student's lack of concentration. Giovanni (2018) argues that studying in the morning is more effective than studying at other times. A student will have difficulty learning during the day because the body is tired of receiving learning from the morning (Aziz & Ali, 2019). Students who are not in optimal condition will be less effective in following the learning, which resulted in the level of questions asked is also still low and the occurrence of repeated questions on the material that has been explained. In school A and B Science Learning is done at noon above 12 o'clock, while in school C learning is done in the morning until noon. Another factor is the lack of teachers in varying the learning stimulus. Lack of teachers in providing a variety of stimuli to students can cause students to be lazy to learn, not caring about teachers or students busy with their own work (Maulidar & Ulfa, 2019).

3.4. The Correlation of Question Rate to Level Achievement School

The results of the correlation test of the level of questions to the level of school achievement showed that there was no significant relationship, the level of correlation strength was low, but the direction of correlation remained unidirectional (Table 5). The level of school achievement is related to the level of questions students ask, but the relationship is not strong. The application of zoning system conducted by the government can be one of the factors causing the absence of a significant relationship between the level of questions with the level of school achievement. A zoning system can create a more equitable school or peer environment in all schools because it encourages equitable distribution of outstanding students (Syakarofath et al., 2020). Zoning system makes the difference in the quality of students in each school is not too prominent, so that the overall quality of the questions asked siswapun be almost the same even though the facilities and infrastructure, learning methods, as well as the quality of school teachers A and B better than school C.

Table 5. Results of Correlation Tests Based on Level Achievement School

Sig. Value	Correlation Coefficient
0,541	0,060

3.5. Conclusion

Based on the data obtained in relation to the questions asked by students based on gender and level of school achievement, the following conclusions were drawn :

The tendency of the level of questions asked by male and female students was still at a low cognitive level, with the highest level being at the C4 level. Based on the percentage level of questions, there are differences in the number, level and indicators of questions asked by male and female students due to differences in biological factors of brain composition and social factors of both genders. Male students asked more questions at C3 and C4 levels than female students, while female students were superior in the number of questions because female students had better communication skills (Amin, 2018).

School A and B which are schools with first and second level of achievement are superior in the number of questions because the facilities and infrastructure supporting learning in school A and more complete than school C. In addition, the learning methods used by school A and B are more innovative than school C. Innovative learning methods can stimulate learners to participate actively and participate in the learning process (Hasriadi, 2022). School teachers A and B also often give students the opportunity to ask questions and provide more enthusiastic feedback. However, neither a, B, and C schools have been able to ask questions at C5 and C6 levels and still ask more questions at low cognitive levels.

There is no significant relationship between the level of questions with gender, besides the level of relationship strength is also very weak and the direction of the relationship is not in the same direction. Gender is not the only factor that affects students ' learning process which in this case is related to the level of questions asked.

The absence of a significant relationship between the level of questions with tingkat school achievement, in addition to the level of strength of the relationship is also very weak, but the direction of the relationship unidirectional. One factor that makes the level of student achievement is not significantly related to the level of questions is due to the zoning system that makes the quality of students more evenly distributed.

References

- Abnisa, A. P. (2024). Peranan Motivasi Belajar PAI Siswa Melalui Metode Tanya Jawab di SMAN 6 Tangerang. *Jurnal Ilmiah Profesi Pendidikan*, 9(1), 375-380. <https://doi.org/10.29303/jipp.v9i1.2066>
- Aderson, & Krathwohl, D. R. (2002). A Revision of Bloom's Taxonomy: An Overview. *Theory Into Practice*, 41(4), 212-218.
- Amin, M. S. (2018). Perbedaan Struktur Otak dan Perilaku Belajar Antara Pria dan Wanita; Eksplanasi dalam Sudut Pandang Neuro Sains dan Filsafat. *Jurnal Filsafat Indonesia*, 1(1). <https://doi.org/10.23887/jfi.v1i1.13973>
- Anand, K., & Dhikav, V. (2012). Hippocampus in health and disease: An overview. In *Annals of Indian Academy of Neurology* (Vol. 15, Issue 4, pp. 239-246). <https://doi.org/10.4103/0972-2327.104323>

- Imaniyati, N., Ramdhany, M. A., Rasto, R., Nurjanah, S., Solihah, P. A., & Susilawati, A. (2024). Neuroscience Intervention for Implementing Digital Transformation and Organizational Health Completed with Literature Review, Bibliometrics, and Experiments. *Bibliometrics, and Experiments Article in Indonesian Journal of Science and Technology*, 9(2), 287–336. <https://doi.org/10.17509/ijost.v9i2.67763>
- Atmaja, H. T. (2019). Pelatihan dan Pendampingan Pembuatan dan Pemanfaatan Media Audio-Visual Interaktif dalam Pembelajaran Sejarah yang Berbasis pada Konservasi Kearifan Lokal Bagi MGMP Sejarah Kabupaten Banjarnegara. *Jurnal Panjar*, 1(2), 131–140. <https://journal.unnes.ac.id/sju/index.php/panjar/>
- Aziz, & Ali, S. (2019). Pengaruh Jam Belajar pada Mata Pelajaran Matematika terhadap Prestasi Belajar Siswa Kelas XI SMA Negeri 1 Batauga. *Jurnal Akademik Pendidikan Matematika*, 5(2), 94–101. <https://www.ejournal.lppmunidayan.ac.id>
- Fitria, Y. (2017). Efektivitas Capaian Kompetensi Belajar Siswa Dalam Pembelajaran Sains di Sekolah Dasar. *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, 1(2), 34–42. <http://e-journal.unp.ac.id/index.php/jippsd>
- Giovanni, E. K. (2018). Pengaruh Waktu Belajar Terhadap Minat, Keaktifan Dan Hasil Belajar Siswa Dalam Pembelajaran Fisika Pada Siswa Kelas XI MIPA SMA BOPKRI 1 Yogyakarta Tahun Pelajaran 2017/2018 Pada Materi Gelombang Bunyi. Universitas Sanata Dharma Yogyakarta.
- Goldstein, A., Covington, B. P., Mahabadi, N., Fassil, ;, & Mesfin, B. (2019). *Neuroanatomy, Corpus Callosum*. ncbi.nlm.nih.gov/books/NBK448209
- Hadiyanto, A. W. R., & Suyadi, S. (2023). Pembelajaran Berbasis Diferensiasi Otak Siswa Laki-laki dan Perempuan Pada Kelas Khusus Perspektif Neurosains. *Edukatif: Jurnal Ilmu Pendidikan*, 5(5), 1995–2007. <https://doi.org/10.31004/edukatif.v5i5.5407>
- Hapnita, W., Abdullah, R., Gusmareta, Y., & Rizal, F. (2018). Faktor Internal dan Eksternal yang Dominan Mempengaruhi Hasil Belajar Menggambar dengan Perangkat Lunak Siswa Kelas XI Teknik Gambar Bangunan SMKN 1 Padang Tahun 2016/2017. *CIVED Jurusan Teknik Sipil*, 5(1), 2175–2182.
- Haqiqi, A. K., Citra Resmi, A., Lestiyanto, B., & Dwi Puspitasari, Y. (2019). Interaksi Sosial Wanita Pengrajin Batik Terhadap Keluarga di Desa Bakaran Kabupaten Pati. *IJTIMAIYA Journal of Social Science Teaching*, 3(1), 1–15.
- Hasriadi. (2022). Metode Pembelajaran Inovatif di Era Digitalisasi. *Jurnal Sinestesia*, 12(1), 136–151. <https://sinestesia.pustaka.my.id/journal/article/view/161>
- Hidayat, E. (2014). Faktor-Faktor yang Mempengaruhi Mutu Sekolah (Pengaruh dari Faktor Kinerja Mengajar Guru dan Pemanfaatan Sumber Belajar). *Jurnal Administrasi Pendidikan*, 11(1), 1–8.
- Inah, E. N. (2015). Peran Komunikasi Dalam Interaksi Guru dan Siswa. *Jurnal Al-Ta'dib*, 8(2), 150–167.
- Kurth, F., Gaser, C., & Luders, E. (2021). Development of sex differences in the human brain. *Cognitive Neuroscience*, 12(3–4), 155–162. <https://doi.org/10.1080/17588928.2020.1800617>
- Maulidar, & Salawa, U. (2019). Keterampilan Guru dalam Memberikan Variasi Stimulus dalam Proses Pembelajaran Di Kelas V SD Negeri 14 Banda Aceh. *Jurnal Buah Hati*, 6(1), 1–16.
- Megasari, R. (2014). Peningkatan Pengelolaan Sarana dan Prasarana Pendidikan untuk Meningkatkan Kualitas Pembelajaran Di SMPN 5 Bukittinggi. *Jurusan Administrasi Pendidikan FIP UNP*, 2(1), 636–831.
- Meifiani, N. I., & Prasetyo, T. D. (2015). Pengaruh Motivasi Terhadap Prestasi Ditinjau dari Perbedaan Jenis Kelamin Mahasiswa STKIP PGRI Pacitan. *Jurnal Derivat*, 2(1), 1–10.
- Nasution, P. R. (2017). Perbedaan Peningkatan Kemampuan Berpikir Kreatif Matematis dan Kemandirian Belajar Siswa Pada Pembelajaran Berbasis Masalah Dan Pembelajaran Konvensional Di SMPN 4 Padangsidimpuan. *Paidagoge*, 2(1), 46–62.
- Puspita, M. D., & Resdati. (2023). Pola Interaksi Sosial Perempuan Pencak Silat Pagar Nusa Di Desa Makmur Sejahtera Kecamatan Gunung Sahilan Kabupaten Kampar. *NUSANTARA: Jurnal Ilmu Pengetahuan Sosial*, 10(3), 1470–1476. <http://jurnal.umtapsel.ac.id/index.php/nusantara/index>
- Rahmiati, & Aziz, F. (2023). Peranan Guru Sebagai Motivator Terhadap Motivasi Belajar Siswa di SMPN 3 Kepulauan Selayar. *INNOVATIVE: Journal Of Social Science Research*, 3(3), 6007–6018.
- Rusdiana, H., Noor, M., & Samdani, F. H. (2014). Figur Guru Ideal Menurut Persepsi Siswa Sekolah Menengah Atas Negeri Se-Kota Banjarmasin. *Tashwir*, 2(4), 207–216.
- Salamah, A. N., & Susiyawati, E. (2022). Analisis Keterampilan Bertanya Siswa Kelas VIII Pada Mata Pelajaran IPA. *PENDIPA Journal of Science Education*, 2022(6), 704–711. <https://ejournal.unib.ac.id/index.php/pendipa704>
- Soekanto, S. (2016). *Sosiologi : Suatu Pengantar*. PT Raja Grafindo,.
- Sriyati, S., & Wahyu, P. E. (2019). Penerapan Pembelajaran Pengajaran Masalah Untuk Meningkatkan Keterampilan Bertanya Siswa Pada Konsep Virus dan Bakteri Kelas X. *Artikel Pemakalah Paralel*, 452–460. <https://www.thirteen.org>
- Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.
- Suryaningsih, Y. (2017). Pembelajaran Berbasis Praktikum Sebagai Sarana Siswa Untuk Berlatih Menerapkan Keterampilan Proses Sains Dalam Materi Biologi. *Jurnal Bio Education*, 2(2), 49–57.
- Suyadi, S. (2018). Diferensiasi Otak Laki-laki dan Perempuan Guru Taman Kanak-kanak Aisyiyah Nyai Ahmad Dahlan Yogyakarta: Studi Pendidikan Islam Anak Usia Dini Perspektif Gender dan Neurosains. *Sawwa: Jurnal Studi Gender*, 13(2), 179. <https://doi.org/10.21580/sa.v13i2.2927>

- Syakarofath, N. A., Sulaiman, A., & Irsyad, M. F. (2020). Kajian Pro Kontra Penerapan Sistem Zonasi Pendidikan di Indonesia. *Jurnal Pendidikan Dan Kebudayaan*, 5(2), 115–130. <https://doi.org/10.24832/jpnk.v5i2.1736>
- Vale, R. D. (2013). The value of asking questions. *Molecular Biology of the Cell*, 24(6), 680–682. <https://doi.org/10.1091/-mbc.E12-09-0660>
- Winata, I K. (2021). Konsentrasi dan Motivasi Belajar Siswa Terhadap Pembelajaran Online Selama Masa Pandemi Covid-19. *Jurnal Komunikasi Pendidikan*, 5(1), 13–24. www.journal.univetbantara.ac.id/index.php/komdik
- Yanto, N., & Zubair, S. (2022). Profil Kemampuan Bertanya Mahasiswa Calon Guru IPA. *PHYDAGOGIC: Jurnal Fisika Dan Pembelajarannya*, 5(1), 23–27. <https://doi.org/10.31605/phy.v5i1.2115>
- Yuliadarwati, N. M., Agustina, M., Rahmanto, S., Susanti, S., & Septyorini. (2020). Gambaran Aktivitas Fisik Berkorelasi Dengan Keseimbangan Dinamis Lansia. *Jurnal Sport Science*, 10(2), 107–112.
- Yuliati, Y. (2017). Miskonsepsi Siswa pada Pembelajaran IPA serta Remediasinya. *Jurnal Bio Education*, 2(2), 50–58.