Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram
https://e-journal.undikma.ac.id/index.php/prismasains/index
e-mail: prismasains.pkpsm@gmail.com

April 2023. Vol. 11, No. 2
p-ISSN: 2338-4530
e-ISSN: 2540-7899
pp. 485-498

Gender in Problem Based Learning: Curiosity Analysis, Problem Understanding, and Problem Solving Ability

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Received: March 2022; Revised: March 2023; Published: April 2023

Abstract

Research objectives This is analyze the effect of problem-based learning and gender on students' curiosity, problem understanding, and problem-solving abilities. This research was conducted on two classes of Mataram Model X Madrasah Aliyah students who were selected using cluster random sampling technique. Student curiosity data was measured using a questionnaire instrument, while problem understanding and students' problem solving abilities were measured using a question test instrument. Then, the data were analyzed by MANOVA at a significance level of 5%. The results showed that problem-based learning had a significant effect on curiosity and problem solving abilities, but did not have a significant effect on problem understanding. . The curiosity of male students is higher than that of female students, but the opposite occurs in the conventional group in classes taught with problem-based learning. The problem comprehension of male students was lower than that of female students in both study groups. problem solving of female students is higher than the group of male students. However, gender has no significant effect on curiousity, problem comprehension , and problem solving ability. The interaction of problem-based learning and gender has no significant effect on curiousity problem comprehension and problem solving abilities.

Keywords: Gender; Based Problem ; Desire Know; Understanding Problem

How to Cite: Yusuf, Y. (2023). Gender in Problem Based Learning: Curiosity Analysis, Problem Understanding, and Problem Solving Ability. *Prisma Sains : Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram, 11*(2), 485-498. doi:https://doi.org/10.33394/j-ps.v11i2.7733

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INTRODUCTION

In the current era, the world of work is increasingly realizing the importance of gender equality and embracing diversity in the workplace. Many organizations and companies are actively looking for ways to increase women's participation in jobs previously dominated by men, such as the fields of technology or science. In addition, practices such as work flexibility and family leave are also being increasingly implemented to help men and women meet the demands of their work and family responsibilities. Even so, there are still challenges in achieving gender equality in the workplace (Stamarski & Son Hing, 2015), such as the wage gap that is still different between men and women in several fields, as well as the perceptions of society that still exist about gender roles in the workplace (Agung, 2022; Jain & Jamali, 2016). Therefore, concrete efforts and actions are still needed from organizations, governments, and society at large to achieve gender equality and embrace diversity in the workplace.

Problem understanding skills, curiosity, and problem solving skills are very important in the 21st century era, for both men and women (Hunaepi et al., 2021a, 2021b; Malik et al., 2019)These abilities will help individuals face complex challenges in real life, compete in a rapidly changing global environment, develop innovative solutions, solve social problems,

and achieve career success. Therefore, effective education and learning to develop these abilities is very important (Mayarni et al., 2021)

Today's life is increasingly complex and rapidly changing, and often requires problem-solving skills, curiosity, and problem-solving skills (Hunaepi et al., 2020). This ability is important in the context of work, education and everyday life, because it can help individuals find creative and innovative solutions to problems at hand. Global competition is getting tougher, so that individuals who have the ability to understand problems, curiosity, and good problem-solving skills will be better able to compete and adapt quickly to a changing global environment.

Innovation and technology are advancing at a rapid pace, and problem understanding, curiosity, and problem-solving skills are essential for developing new technologies and innovative solutions to existing problems. Social problems such as poverty, climate change and social inequality are increasingly complex and require problem understanding, curiosity and problem-solving skills to find effective solutions. The ability to understand problems, curiosity, and problem-solving skills are also very important in achieving career success, both in the private and public sectors.

Curiosity is a desire in a person to find out about a certain object or event that is obtained through observation, hearing or measurement (Menning, 2019; Nurdiana et al., 2023; Suhirman et al., 2022). Understanding of a problem is knowledge of the intricacies of the problem which includes what, why, and how the problem occurs. The ability to solve problems includes skills in finding alternative solutions and trying these solutions to prove that the solutions provided can solve the problems at hand.

In the workplace and academic context, both women and men are valued equally. This is reflected in the participants' narratives which state that gender is not important. What is more important is one's school and workplace experience as an individual, thus enabling women to enter male-dominated fields such as engineering without any problems.

Currently, the world of work no longer distinguishes gender as a priority in determining position. A woman who was previously doubted in terms of leadership, is now given an open space to lead a unit, institution, and even government. Someone who works in an organization can work well and lead successfully when he has and fully applies the knowledge, attitudes, and skills in his work environment.

The world of work is increasingly recognizing the importance of gender equality and embracing diversity in the workplace. Many organizations and companies are actively looking for ways to increase women's participation in jobs previously dominated by men, such as the fields of technology or science.

However, still there is challenge in reach gender equality in place work. One of them is gap wages between still men and women There is in a number of field, as well perception public about gender roles in place work. In some culture, man considered superior than Woman in matter intelligence and ability, which impact on perception public about ability Woman in various field, incl ability solving problem. Women often pushed For take role traditional like nurse children and family, meanwhile man pushed For chase career and earn money. It can too affect perception public about ability Woman in matter solving problem, because gender stereotypes that develop in society say that Woman tend more emotional and lacking logical so that considered not enough capable in matter solving problem.

Because it is needed effort For give description results study about ability academic boy and girl to public in a manner broad, as step For reach gender equality and embracing on site diversity work. The industrial era 4.0 demands somebody For own ability solve problem. demands This must fulfilled by the institution education, which must be facilitate grow the flower ability student in understand and solve problem as well as arouse desire know student. Various innovation must Keep going done For encourage and train ability these, incl ability understand problems and skills solve problem. One strategy related learning with competence the is a learning model based problem. Problem Based Learning (PBL) is a

learning model that focuses on solving real problem in real world situation or relevant context with student (Boelt et al., 2022; Guo et al., 2020; Mirawati et al., 2017). In the PBL method, students Work The same in group For look for solution the best, and the teacher plays a role as facilitator and mentor For help student develop ability solving problem, work same, and thought critical (Suaedin et al., 2014).

PBL theory is based on the concept constructivism says that student will more active in learning If they build knowledge Alone through experience and interaction with environment around (Trullàs et al., 2022). Besides In addition, PBL is also based on theory Study stressed social importance interaction social and work The same in learning .

A number of study show that (Eko et al., 2018; Laili et al., 2019; Malik et al., 2019). PBL can increase students' curiosity, problem understanding, and problem solving abilities. PBL provides opportunities for students to learn through experience and exploration, so as to increase students' curiosity about the material being studied. In addition, PBL also encourages students to develop problem solving abilities through critical and creative thinking processes in solving given problems. However, this research has not revealed how the abilities of male and female students. This study analyzes students' curiosity, problem understanding, and problem-solving skills based on gender in problem-based learning. This study aims to analyze the effect of problem-based learning and gender on students' curiosity, problem understanding, and problem-solving abilities in terms of gender.

METHOD

This research is a quasi-experiment with a 2 x 2 treatment by level design conducted at the Mataram Model Madrasah Aliyah. In this study, two experimental group classes and two control group classes were selected using cluster random sampling technique. The experimental group received a learning treatment with a problem-based learning strategy (A1), which consisted of 38 male and female students, while the control group received conventional learning (A2) with the same number of students.

Problem-based learning strategies (A1) consist of PBL-based learning plans, student worksheets, and experimental materials. Learning in both experimental and control classes was carried out by the same teacher, namely the biology teacher at the Madrasah. During the learning in the two groups, observations were made to ensure that the learning took place according to plan.

After four learning meetings, the final measurement was carried out on students' understanding of the problem, students' curiosity, and students' problem solving skills. Students' understanding of the problem was measured by tests (reliability = 0.95), students' curiosity was measured by self-assessment sheets (reliability = 0.81), and students' problem solving skills were measured through essay tests (reliability = 0.81).

Data on student comprehension test scores, curiosity self-assessment scores, and student problem-solving skills test scores were analyzed using descriptive and inferential statistics. Descriptive statistical analysis was carried out to get an overview of the trends in parameters such as the average score, highest score, standard deviation, and categories of students' understanding of the problem, self-assessment of curiosity, and students' problem-solving skills between the experimental group and the control group.

Student understanding of the problem, student curiosity, and student problem-solving skills are then categorized using benchmark reference assessment standards (PAP), namely 86-100 (very high), 71-85 (high), 56-70 (moderate), 40 -55 (low), and 0-39 (very low) (Trianto & Suseno, 2017)

Inferential statistics using MANOVA were used to test the research hypothesis at a significance level of 0.05. There are three hypotheses tested, namely: (1) The problem-based learning model has a significant effect on students' understanding of problems, students' curiosity, and students' problem solving skills, (2) Gender has a significant effect on students' understanding of problems, curiosity students, and students' problem solving skills, and (3)

Problem-based learning models and gender together have a significant effect on students' understanding of problems, student curiosity, and student problem solving skills

RESULTS AND DISCUSSION

Once done treatment learning in two group research , do it measurement against desire know student. Data about desire know student the Then presented in Table 1.

Table 1. Comparison Curiosity Score in Groups Study

Groups	Gender	Means	std. Deviation	N	Category
A1 (PBL)	B1 (Male)	3.2223	.24970	13	high
	B2 (Female)	3.0400	.28117	25	high
	Total				high
A2 (Conventional)	B1 (Male)	2.6669	.85553	13	Medium
	B2 (Female)	2.8716	.40000	25	high
	Total	2.8016	.59233	38	high
Total	B1 (Male)	2.9446	.67931	26	high
	B2 (Female)	2.9558	.35259	50	high
	Total	2.9520	.48484	76	high

Table 1 shows difference in the average curiosity score of students between PBL groups and groups conventional . The average curiosity score of students in the PBL group is higher tall compared to with group conventional. This show that learning with problem-based learning method (Rachmawati et al., 2022)). Besides that, results analysis show difference in the average curiosity score of students between group boys (B1) and girls (B2) in groups A1 and A2. In the PBL group , the average student curiosity score male (B1) more tall compared to with student female (B2), but in the group conventional, the average curiosity score of students male (B1) more low compared to with student female (B2).

Distribution student boy and girl based on curiosity category shows exists variation . Description distribution percentage student based on gender in the category of curiosity in PBL and conventional classes presented in Table 2 and Figure 1.

Table 2. Gender Portion in Group Curiosity Category Study

	PBL				Conventional			
	Male		Female		Male		Female	
Categories	f	%	f	%	f	%	f	%
Very High	1	7,7	1	4	0	0	1	4
high	10	77	16	64	6	46	7	28
Medium	2	15	7	28	4	31	10	40
Low	0	0	1	4	1	7,7	7	28
Very Low	0	0	0	0	2	15	0	0
Total	13	100	25	100	13	100	25	100

Table 2 shows that the percentage of male students who have a very high curiosity category compared to female students. The results were found in two study groups. There were no male students in the PBL group who were included in the Low and Very Low categories.

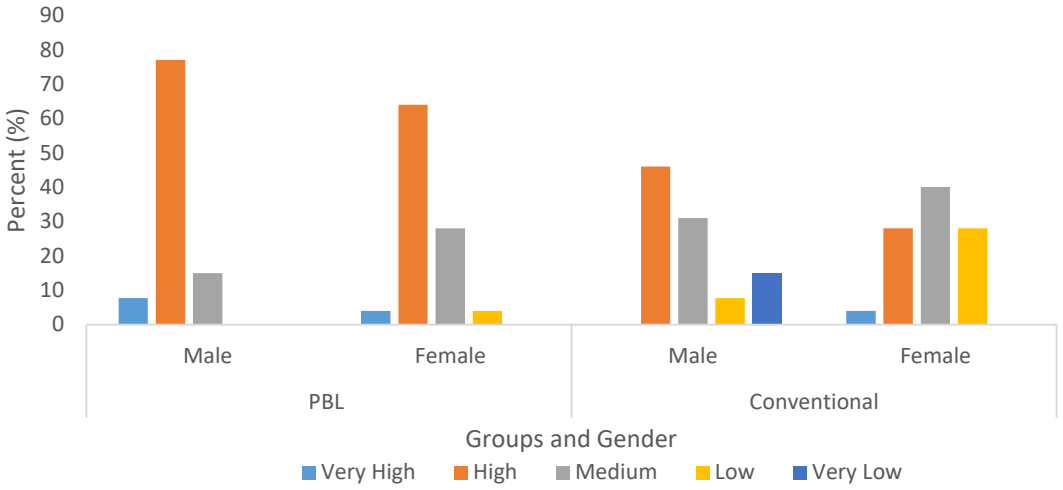

Figure 1. Comparison Portion Student Boys and Girls inside curiocity in groups research .

Figure 1 shows that more male students fall into the high curiosity category in the PBL group and the conventional group. Learning with PBL encourages male students to have greater curiosity than female students. The problem of students' understanding refers to their ability to analyze facts and phenomena that occur in the observed environment. The problem understanding test was carried out after the learning treatment. Data on students' problem understanding scores are presented in Table 3.

table 3. Comparison Group Problem Comprehension Score Study

Groups	Gender	Means	std. Deviation	N	Category
A1 (PBL)	B1 (Male)	74.7246	9.93822	13	high
	B2 (Female)	78.5716	8.80891	25	high
	Total	77.2555	9.26213	38	high
A2 (Conventional)	B1 (Male)	67.3069	22.95400	13	Medium
	B2 (Female)	75.5700	12.27221	25	high
	Total	72.7432	16.86286	38	high
Total	B1 (Male)	71.0158	17.73753	26	high
	B2 (Female)	77.0708	10.68044	50	high
	Total	74.9993	13.70263	76	high

Table 3 shows difference in mean scores understanding problem between students who follow learning with Problem Based Learning (PBL) methods and students group control . Score average understanding problem student more PBL group tall than group control that follows learning conventional. this show that taught students with PBL method has understanding more trouble Good compared to with studying students with method conventional . (Aulia & Budiarti , 2022) state that the PBL model delivers impact positive to development ability understanding problem .

Besides it, Table 3 also shows comparison of average scores understanding problem student between group boys (B1) and girls (B2) in groups A1 and A2. Score average understanding problem student male (B1) more low than student female (B2) on the second group research . this result show that student Woman own understanding more trouble _ Good than student man .

Study this also shows that PBL is capable of push Lots students in categories very height and category tall compared to with learning conventional . Comparison frequency student based on category understanding group problem _ study can seen in Table 4 and Figure 2.

Table 4. Gender Portion in Group Problem Comprehension Category Study

	PBL				Conventional			
	Male		Female		Male		Female	
Categories	f	%	f	%	f	%	f	%
Very High	1	7,7	5	20	1	7,7	3	12
high	9	69	16	64	7	54	14	56
Medium	3	23	4	16	4	31	8	32
Low	0	0	0	0	0	0	0	0
Very Low	0	0	0	0	1	7,7	0	0
Total	13	100	25	100	13	100	25	100

Table 4 shows that the percentage of female students who have problem comprehension categories is very high and the height is greater than male students. The results were found in two study groups. There were no male students in the PBL group who were included in the Low and Very Low categories.

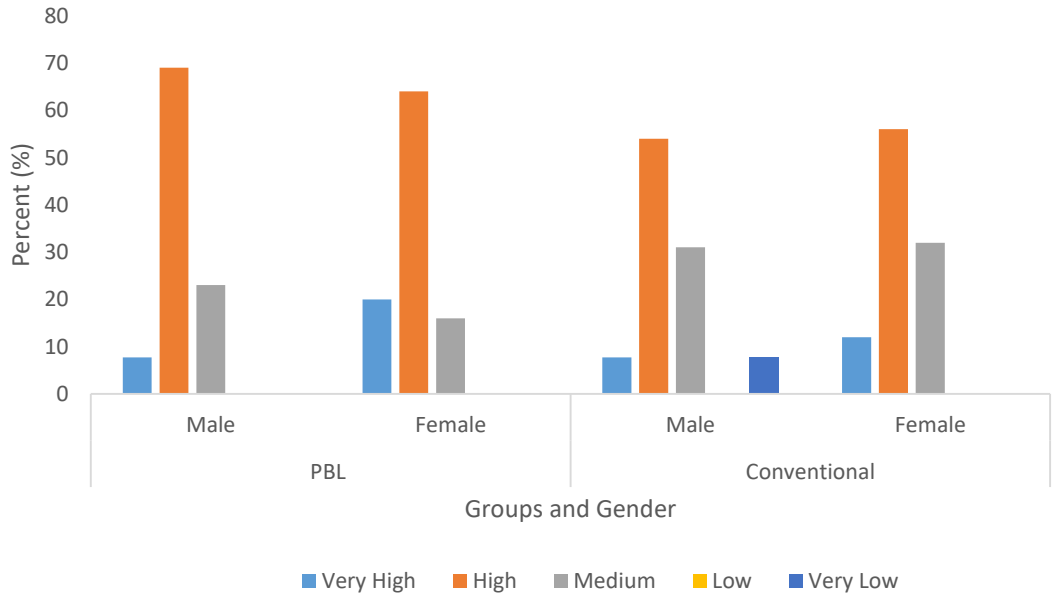

Figure 2. Comparison Portion Student Boys and Girls in problem comprehension in groups research .

Shows that more female students fall into the category of very high *problem comprehension* in the PBL and conventional groups. Learning with PBL encourages female students to have *a better problem comprehension than* male students. Measurement of *problem solving was carried* out after treating learning in the two research groups. Student *problem solving* data is presented in Table 1 .

Table 5. Comparison Problem Solving Scores in Groups Study

Groups	Gender	Means	std. Deviation	N	Category
A1 (PBL)	B1 (Male)	72.8231	11.05442	13	high
	B2 (Female)	78.1320	12.39905	25	high
	Total	76.3158	12.07760	38	high
A2 (Conventional)	B1 (Male)	40,0000	17.43775	13	Medium
	B2 (Female)	38.6600	16.65836	25	high

	Total	39.1184	16.70433	38	high
Total	B1 (Male)	56.4115	22.01645	26	high
	B2 (Female)	58.3960	24.67138	50	high
	Total	57.7171	23.66732	76	high

Table 5 shows exists difference in mean scores problem solving ability between student group PBL research and cohorts control. The average score of students' problem solving in the PBL group is higher tall compared to with group conventional. this indicate that problem solving abilities of students being taught with more PBL Good than learning conventional .

Besides it, Table 3 also shows comparison of the average score of students' problem solving between group boys (B1) and girls (B2) in groups A1 and A2. In the PBL group , the average score of students' problem solving female (B2) more tall compared to with student male (B1). this show that students' problem solving abilities Woman more Good compared to with student man.

From the results research , got concluded that PBL is capable of push Lots students in categories very height and category high, in comparison with learning conventional . Comparison frequency student based on comprehension problem categories in groups study presented in Table 6 and Figure 3.

Table 6. Gender Portion in Group Problem Solving Category Study

	PBL				Conventional			
	Male		Female		Male		Female	
Categories	f	%	f	%	f	%	f	%
Very High	3	23	12	48	0	0	0	0
high	5	38	6	24	0	0	2	8
Medium	4	31	7	28	3	25	3	12
Low	1	7,7	0	0	3	25	4	16
Very Low	0	0	0	0	6	50	16	64
Total	13	100	25	100	12	100	25	100

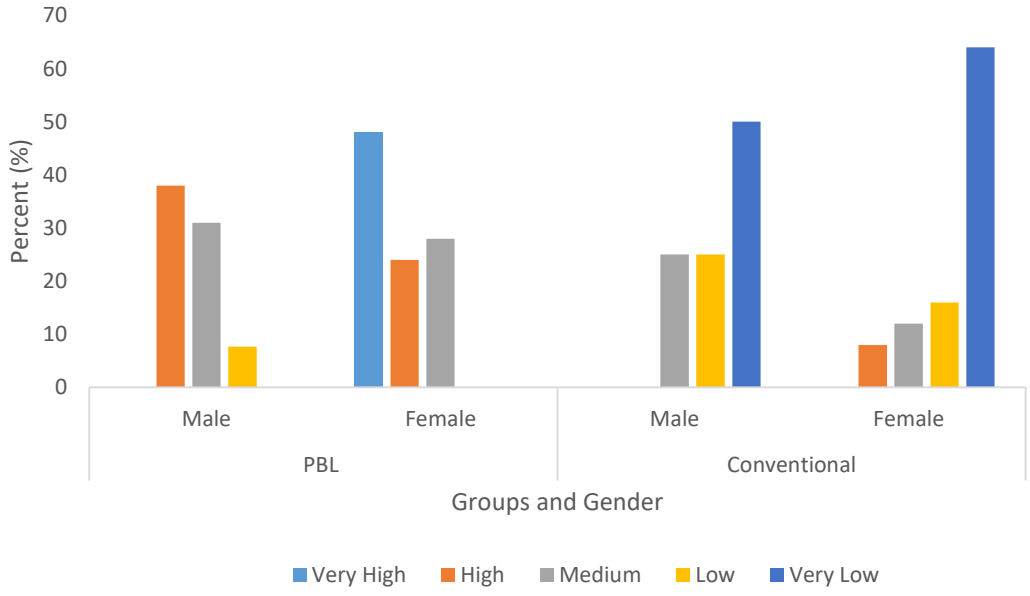

Figure 3. Comparison Portion Student Boys and Girls inside problem solving abilities in groups research .

Figure 3 shows that percentage reached woman category very problem solving ability tall and tall very high. In second group research, there is student incoming woman to in category very problem solving ability high, however student man No can reach category the . Learning with PBL pushing student Woman For own more problem solving abilities Good compared to with student man.

After the data is presented with statistics descriptive, then hypothesis testing is carried out research. Before hypothesis testing is carried out, moreover formerly prerequisite test namely data normality test and data homogeneity test. The results of the data normality test are presented in Table 7 and the results of the data homogeneity test are presented in Table 8.

Table 7. Normality test results

treatment	Statistics	Sig.
A1B1	0.163	0.200 *
A1B2	0.318	0.073
A2B1	0.183	0.200 *
A2B2	0.223	0.134

Based on Table 7, the four treatments have statistical value with Sig. value greater than 0.05. Therefore, data for all treatments were declared normally distributed.

table 8. Homogeneity Test Results

F	Sig.
2,909	0.066

Table 8 shows that the Levene's Test of Equality of variances have F-value with Sig. value greater than 0.05. Therefore, groups were declared to have a homogeneous variance.

After the data is declared normal and homogeneous, hypothesis testing is carried out. Test the hypothesis with ANOVA using SPSS 16.0 to see the Main Effect and Simple Effect at a significance of 0.05. The results of the analysis are presented in Table 9.

Table 9. Results of *Tests of Between-Subjects Effects*

Source	Dependent Variables	Type III Sum of Squares	df	MeanSquare	F	Sig.
Corrected Model	Curiousity	2.362a –	3	.787	3,712	.015
	Problem Comprehension	1097,401b –	3	365,800	2028	.118
	Problem Solving	26545650c –	3	8848550	41,196	.000
Intercepts	Curiousity	595,518	1	595,518	2.808E3	.000
	Problem Comprehension	375112.126	1	375112.126	2.080E3	.000
	Problem Solving	225460555	1	225460555	1.050E3	.000
Groups	Curiousity	2,240	1	2,240	10,564	002
	Problem Comprehension	464,244	1	464,244	2,574	.113
	Problem Solving	22350499	1	22350499	104057	.000
Gender	Curiousity	002	1	002	010	.920

	Problem Comprehension	627,137	1	627,137	3,477	.066
	Problem Solving	67,362	1	67,362	.314	.577
Groups * Gender	Curiousity	.640	1	.640	3.020	087
	Env. Knowld	83,396	1	83,396	.462	.499
	Problem Solving	189,048	1	189,048	.880	.351

Table 9 shows that PBL has a significant effect on curiosity (F = 10.564, p = 0.002) and problem solving skills (F = 104.057, p = 0.000), but does not have a significant effect on problem comprehension (F = 2.574, p = 0.113). In addition, gender had no significant effect on curiosity (F = 0.010, p = 0.920), problem comprehension (F = 3.477, p = 0.066), and problem solving ability (F = 0.314, p = 0.577). The interaction of PBL and gender also had no significant effect on curiosity (F = 3.020, p = 0.087), problem comprehension (F = 0.462, p = 0.499), and problem solving ability (F = 0.880, p = 0.351).

It can be concluded that the average curiosity score of students in the PBL group is higher than the conventional group. Problem-based learning is better at increasing students' curiosity than conventional learning. In the PBL group, the average curiosity score of male students (B1) was higher than female students (B2), while in the conventional group, the average curiosity score of male students (B1) was lower than female students (B2). .

The curiosity of students in the PBL group arises when they are faced with authentic problems that are around them at the student orientation stage on the problem. (Meliyanti & Munawati, 2022) . Learning that starts with presenting pictures and stories about environmental phenomena that are damaged, such as photos of dead fish because they live in pool water affected by detergent waste can increase students' curiosity. Seeing various problems around their environment, students become curious and are encouraged to ask questions about what, why, and how these phenomena occur. Problem authentic can help students rise in PBL by giving deeper meaning to learning, triggering active student involvement, developing critical thinking skills, and encouraging cooperation and collaboration between students

Problem-based learning provides space for students to analyze problems, find out the causes of problems, think of alternative solutions, and try out their ideas (Prayogi & Asy'ari, 2013; Suaedin et al., 2014). In addition, students are also taught to make assumptions that the solutions they provide will solve a problem. Students are expected to be able to conduct experiments by controlling all the variables involved and observing small changes in their experimental group, recording the necessary data, and analyzing it until they come to a decision that the solution ideas they offer have been tested experimentally with convincing results. (Nur et al., 2020)In PBL, students are also given the opportunity to re-check the problem-solving process when their assumptions differ from the experimental results that have been carried out.

Learning activities like this are able to get students involved and interested in following the path of their curiosity. They will be involved in work to answer their curiosity about a problem. The data also shows that there are variations in the distribution between male and female students in the curiosity category. The percentage of male students who have a very high and high curiosity category is greater than that of female students. This can be seen in the two learning groups. In addition, there were no male students in the PBL group who were in the low and very low categories.

These results are influenced by PBL which gives students opportunities to solve authentic problems through discussions about how they will find answers or solve given

environmental problems, seeking information or knowledge from various sources such as the internet which allows students to be literate in technology. In addition, students are also trained to find and select the necessary information from a number of information obtained from various learning sources. Thus, after obtaining the necessary information, students have a better understanding of environmental conservation.

Problem-based learning has an influence on the high average score and curiosity category in the PBL group. According to (Boelens et al., 2015), the quality of the problem plays an important role in stimulating students in learning. Learning begins by introducing students to authentic problems about the environment, where they are asked to analyze the problems presented in news and pictures. This activity encourages students to ask questions, gather information, and explore various things that have not yet been answered. Curiosity that arises continuously encourages students to peer, investigate, and solve various problems.

According to (Pramiasari et al., 2022), high curiosity always leaves someone feeling curious and encourages them to explore and discover new things that have never been found before (Pramiasari et al., 2022). There was a significant difference in the mean problem understanding scores between the PBL and control groups. The average score of students' problem understanding in the PBL group was higher than the control group, indicating that the problem understanding of students taught with PBL was better than conventional learning.

The content of the problems presented in learning also had an effect on the high average scores and curiosity categories in the PBL group. According to (Boelens et al., 2015), in problem-based learning, the quality of problems has a role in stimulating students in learning. In problem-based learning, learning begins by confronting students with authentic problems regarding the environment. Students are asked to analyze the problems presented in news and pictures, for example the problem of how abiotic components affect biotic components. This activity encourages students to ask questions, always arouse curiosity, dig, trace, and investigate various things that have not yet found answers, and spy, peek, and uncover various things that are still unclear.

Curiosity always leaves curiosity (Pramiasari et al., 2022) . It is this curiosity that can make someone always ask questions and raise concerns about something they want to know. That's why they love to explore, learn, and discover new things that have never been found before

There was a difference in the average problem comprehension scores between students in the PBL research group and the control group, where the average problem comprehension scores in the PBL group were higher than the conventional group. This shows that the understanding of the problems of students who are taught with PBL is better than conventional learning.

Understanding the problems of students taught with PBL tends to be better because this approach provides a more real and contextual learning experience. In PBL, students are given real-world tasks or problems that they must solve through a process of investigation and reflection. Students are expected to understand the context of the problem thoroughly and find effective solutions. Experience-based learning also helps students to understand problems more deeply and encourages them to take initiative in the learning process.

Understanding the problems of students taught with PBL tends to be better because this approach provides a more real and contextual learning experience. Students learn through hands-on learning experiences gained from carrying out real-world assignments or problems, working in diverse groups, and periodically reflecting on their learning experiences. All these factors help students to understand problems more deeply and find effective solutions.

In addition, the results of the study also showed that the average comprehension problem of male students was lower than that of female students in both study groups. The percentage of female students who have very high and high category comprehension problems is also greater than that of male students. The results were found in two study

groups. However, there were no male students in the PBL group which were included in the low and very low categories.

In PBL learning, there are differences in understanding the problems between male and female students. Female students tend to have better verbal skills, so they can process information related to problems more effectively. In addition, female students also tend to have better social and emotional skills, making it easier to collaborate in groups to solve problems.

The involvement of female students in PBL learning also tends to be more active, especially in social interactions and providing input. This helps them understand PBL learning which emphasizes learning through collaboration and discussion between students. Even so, the differences in problem understanding between female and male students in PBL learning are not absolute and can vary for each individual.

The results showed that the average problem solving ability score in the PBL group was higher than the conventional group. Therefore, it can be concluded that the problem solving of students taught with PBL is better than conventional learning. It is important for teachers to pay attention to individual needs and learning styles so that each student can have equal opportunities to learn and develop.

The PBL (Problem-Based Learning) approach activates students to find solutions to given problems so that students are more responsible for their own learning (Liu & Pásztor, 2022). This will increase their confidence, motivation and problem solving skills. The problems given in PBL are usually real so students can understand how the concepts learned can be applied in everyday life. This allows students to develop more relevant and significant problem-solving skills. PBL also involves working in groups to solve problems so students can learn to communicate well, lead and follow, and develop better social skills. Collaboration can help students gain a broader perspective and be more creative in solving problems. In PBL, not only solving problems, but also paying attention to the process for solving these problems. Students can learn about problem solving strategies, identify and solve problems, and evaluate the resulting solutions. This can improve students' problem solving skills on an ongoing basis. With a combination of these characteristics, PBL can help students develop better problem-solving abilities, as well as increase motivation, social skills, and understanding of concepts (Cabrera-Mejía et al., 2020; Mustofa & Hidayah, 2020).

When students are able to understand a problem, it will be easier to determine alternative solutions, seek theoretical and empirical support, determine the stages of solving, as well as planning work in solving the problem solving. The high curiosity of students will encourage them to find out why and how a problem occurs and how a problem can be solved (Hunaepi et al., 2021a; Nurdiana et al., 2023) . Students who have a high curiosity will have foresight in observing phenomena or objects that occur, and be able to connect an event with other events and connect a concept with that event or past events, and predict future events. (Fauzi et al., 2018; Prayogi & Asy'ari, 2021) .

In the PBL group , the average score of students' problem solving female (B2) more tall compared to with student male (B1). this show that students' problem solving abilities Woman more tall compared to with group student man. Ability solving problem student more women tall in learning

PBL can influenced by several factors , including : 1) Difference cognitiv : Some study show that in a manner general, girl tend more Good in verbal, analytical, and reflective abilities, temporarily man tend more Good in ability spatial and mechanic . Ability more analytical and reflective kind to students Woman can help they in understand problem and develop strategy solving effective problem, 2) Characteristics learn : Students Woman tend more organized and more Like Study in a manner collaborative, meanwhile man more Like Study in a manner competitive and independent. Characteristics Study student more women organized and like Study in a manner collaborative can help they in develop Skills solving more trouble Good through Work The same with Friend a group, and 3) Factors social and

cultural: Students Woman in a number of culture Possible more benefited in matter education and development Skills solving problem Because they often expected For become more organized and diligent in learn , as well accept support social from family and friends peer .

CONCLUSION

Based on results research , found that learning based problem give influence significant to problem solving ability (F = 104.057, p = 0.000) and curiousity (F = 10.564, p = 0.002), but No give influence significant to problem comprehension (F = 2.574, p = 0.113). Student curiosity man more tall compared to student female , however different things happens in groups students who follow learning based problem. Temporary That is, student comprehension problems man more low than student female on the second group research . Furthermore , students' problem solving abilities Woman more tall than group student man. Although thus , gender is not give influence significant to curiousity (F = 0.010, p = 0.920), problem comprehension (F = 3.477, p = 0.066), and problem solving ability (F = 0.314, p = 0.577). Besides that is , interaction between learning based problem and gender is not give influence significant to curiousity (F = 3.020, p = 0.087), problem comprehension (F = 0.462, p = 0.499), and problem solving ability (F = 0.880, p = 0.351). Based on findings this , can concluded that learning based problem very effect on problem solving ability and curiousity students , however No influential significant on problem comprehension and not there is influence significant of gender or interaction between gender and learning based problem.

RECOMMENDATION

Learning based problem can applied in practice learning For increase problem solving abilities and curiousity student without must consider gender as influential factors.

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