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Implementation Analysis of Problem Based Learning Modeland the Correlation of the Creative Attitude of Class X Students on Chemical Bonding Materials

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ABSTRAK

Purpose of the study: This study aims to analyze the Implementation of the Problem Based Learning Model and its Correlation to the Creative Attitudes of Students in the Chemical Bonding Material for Class X SMA Negeri 5 Tanjung Jabung Timur.

Methodology: This research is a correlational descriptive with a sampling technique using purposive sampling. Data were collected using an instrument in the form of an observation sheet consisting of an observation sheet on the implementation of PBL mode and students' creative attitudes. The data obtained in the form of quantitative data and qualitative data. Quantitative data was tested by regression to see the significance of the effect of implementing the problem based learning model on students' creative attitudes. While the qualitative data obtained were analyzed using the analysis of Miles and Huberman.

Main Findings: The results of the analysis show that the implementation of the PBL model by teachers and students is included in the good category. The correlation coefficient obtained is 0.707, meaning that the relationship between the implementation of the PBL model and students' creative attitudes has a strong relationship level. The results of the t-test indicate that $t_{coun} > t_{table}$ is 5,295>2,048, which means that the implementation of the PBL model affects students' creative attitudes.

Novelty/Originality of this study: Thus, it can be concluded that there is a relationship between the implementation of the PBL model and the creative attitude of class X students of SMA Negeri 5 Tanjung Jabung Timur on chemical bonding.

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1. INTRODUCTION

Education is a business or activity that is carried out intentionally, regularly, and planned with the aim of changing or developing desired behavior. The achievement of these goals is greatly influenced by the ongoing learning process. A good learning process is student-centered, which is able to make students more active in finding information, solving problems with various ideas and being able to apply their understanding in everyday life so as to achieve more optimal learning outcomes [1, 2]. Therefore, the teacher as a facilitator is one of the

important factors responsible for carrying out the learning process so that it can take place as expected [3-6]. One effort that can be done is to teach the material using an appropriate learning model.

Chemistry subjects are one part of natural science whose concepts are often found in life. One example is the concept of chemical bonds. In nature, matter is generally found in the form of molecules that is a combination of several atoms, only a few are in the form of a single atom. The molecules that surround us are examples of chemical bonds. Like the oxygen we breathe every day is an example of bonding chemically, namely O2, the water we use everyday is a chemical bond between 2 hydrogen atoms with 1 oxygen atom forming H2O, besides that there is also sodium benzoate (CH3COONa) which is used as a food preservative which has chemical bonds between the atoms [7, 8]. Chemical bonds are widely applied in the health sector such as medicine, agriculture such as fertilizers, and food. However, there are still many students who are not aware of it because in the learning process they have not linked the concept of chemical bonds with the student's environment and have not made direct observations such as practicum. Thus, the knowledge they have about chemical bonds only comes from textbooks so that the information they get is very limited and students' understanding is temporary. Therefore, a learning model is needed that can make students have a creative attitude in the learning process. One of the learning models that can be used is the problem based learning model [9, 10]

Problem based learning model or problem based learning model is a learning model that emphasizes student activity. In this learning model, students are required to be active in solving a problem [11], [12]. The essence of the problem based learning model is the problem (problem). This learning model is not designed to help teachers provide information as much as possible to students but aims to help students develop thinking skills and problem solving skills [13-15]. In the learning process with this learning model, students are responsible for their own learning, they apply what they already know, find something they need to know, and learn how to get the information they need through various sources. In short, the problem based learning model aims to develop and apply important skills, namely problem solving, self-study, teamwork, and broad knowledge acquisition [16, 17].

Preliminary studies provide information that teachers have tried various learning models in teaching and have also applied problem based learning models on chemical bonding material, but in applying this learning model the teacher has not given.

2. RESEARCH METHOD

Research design

This research is a descriptive correlational research. The design used in this study is a concurrent embedded mix method where quantitative data supports qualitative data [18]. Sampling was done by purposive sampling, namely based on certain considerations [19] and class X was chosen.

Data collection technique

In this study there are 2 types of data to be collected, namely data on the implementation of problem based learning models by teachers and students and data on students' creative attitudes. The data was collected by direct observation of each meeting during the learning process the opportunity for students to conduct investigations such as practicum and the creative attitude of students who are not maximally developed can be seen from the lack of activity of students in participating in chemistry learning. Overcoming existing problems, in teaching chemical bonding material, the right learning model is needed to maximize students' creative attitudes. The chosen alternative is to use the PBL model which is applied to practical activities during the learning process so that students can make direct observations. Observations were made by 7 observers, 1 observer observed the implementation of the problem based learning model by the teacher and then 3 observers observed the implementation of the problem based learning model by students while the creative attitude of students was observed by 3 observers.

Data analysis technique

Analysis of the Observation Sheet for the implementation of the problem based learning model by teachers and students

Table 1. Categories of model implementation problem based learning by teachers and students

Score (%)	Criteria
82.25 – 100.0	Very good
62.49 – 81.24	Good
43.72 – 62.47	Not Good
25.0 – 43.71	Very not good

Data from the implementation of the problem-based learning model by teachers and students, the data obtained is then obtained the percentage.

Table 2. Categories of students' creative attitudes

Score (%)	Criteria
82.25 – 100.0	Very good
62.49 – 81.24	Good
43.72 – 62.47	Not Good
25.0 – 43.71	Very not good

On the student's creative attitude observation sheet using a formula to find the average percentage. The statistical hypotheses in this study are:
H0 : = 0 (no relationship)

Ha : 0 (no relationship)

The relationship that will be seen is the implementation of the problem based learning model with students' creative attitudes. The implementation of the problem based learning model should be reviewed from the teacher and students, but can be represented from the data on the implementation of the model by students, because the activities carried out by students during the teaching and learning process are the result of the activities carried out by the teacher.

Hypothesis testing was continued by looking for a correlation between the implementation of the problem based learning model by students and students' creative attitudes using SPSS 17. The correlation analysis used was Pearson bivariate correlation analysis. After obtaining the correlation value, then the value is interpreted using the correlation coefficient interpretation guidelines in table 3.6 below [20-23]:

Table 3. Guidelines for Interpretation of Correlation Coefficients

Interval koefesien	Level of Relationship
0.00 – 0.199	Very low
0.20 – 0.399	Low
0.40 – 0.599	Enough
0.60 – 0.799	Strong
0.80 – 1.000	Very Strong

To see the significance of the effect of variable X and variable Y homogeneity first. The formula for the t-test is as follows:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Information :

n= the number of test respondents r= correlation coefficient

The calculated t price is then compared with the t table price (attachment), for = 5% with dk = n– 2. Criteria for acceptance of the hypothesis, accept Ha if tcount is greater than ttable (tcount > ttable), otherwise reject Ha and accept H_0.

3. RESULTS AND DISCUSSION

The implementation of the PBL model on chemical bonding materials is in the good category. This can be seen from the percentages obtained by teachers and students on the observation sheet for the implementation of the PBL model, namely 77.31% and 72.44%, which is also supported by qualitative data in the form of observer notes. This proves that the PBL model applied in class X of SMA Negeri 5 Tanjung Jabung Timur has been implemented well.

Qualitative data in the form of teacher and student readiness and classroom management by teachers. Good preparation is very necessary to get or obtain maximum results. The way students learn is also influenced by the relationship with the teacher. In accordance with [24] teachers who do not interact with their students intimately cause the teaching and learning process to be less smooth. Students who feel far from the teacher are reluctant to actively participate in learning. Creative attitude percentage resuls students are included in the good category with a percentage of 71.37% which is also supported by qualitative data in the form of observer notes

that have been analyzed previously. Of the 15 indicators of creative attitude that exist, there are still those that are not achieved well, namely the indicator asking questions according to the field being studied. This is because most students are lacking in asking questions about the material learned during the learning process.

Quantitative data on the implementation of the problem based learning model both by teachers and by students and students' creative attitudes were analyzed and from the results of the normality test obtained a significance value of 0.133 for the implementation of the PBL model by teachers, a significance value of 0.2 for the implementation of the PBL model by students and 0.088 for attitudes creative students and the values are greater than 0.05 so it can be concluded that the data is normally distributed. Furthermore, the data were tested for homogeneity. The results of the homogeneity test of the implementation of the PBL model by the teacher were 0.586 while the results of the homogeneity test of the implementation of the PBL model by students obtained a significance value of 0.69 and the results of the homogeneity test of creative attitudes were obtained 0.066 where the values were greater than 0.05, it can be concluded that concluded that the research data is homogeneous. Furthermore, the two-average similarity test was conducted between the implementation of the PBL model by the teacher and by the students. The value of tcount < ttable (0.91 <2.048) means that the data on the implementation by students can represent the implementation data by the teacher. Then proceed with the correlation test. The correlation coefficient between the implementation of the PBL model with students' creative attitudes on chemical bonding material is 0.707. Based on the guideline table for interpreting the correlation coefficient, the rxy value of 0.707 has a strong relationship level because it is in the range 0.60-0.799. This means that the correlation between the implementation of the PBL model and the creative attitude of students in this study has a strong relationship level.

After it was known that the correlation between the implementation of the PBL model and students' creative attitudes had a strong level of relationship, it was continued with a follow-up t-test. From the results of the t-test, it is known that the value of tcount is 5.295. When compared with ttable with dk (n- 2) = 30-2= 28, at = 0.05, ttable is 2.048, so tcount is greater than ttable (5.295>2.048). Furthermore, the significance value is 0.000 <0.05, which means that the PBL model has an effect on students' creative attitudes. Thus, there is a relationship between the implementation of the PBL model and the creative attitude of class X IV students on chemical bonding material.

With the acceptance of the hypothesis, it can be said that if the implementation of the PBL model is good, the creative attitude of students is good and the better the implementation of the PBL model, the better the creative attitude of students.

4. CONCLUSION

Based on the results of the study, it can be concluded that the implementation of the PBL model by teachers and students on chemical bonding material is included in the good category. This is reinforced by qualitative data that comes from the observer's writing during the learning process. The creative attitude of students on chemical bonding material is also included in the good category, reinforced by qualitative data that comes from the observer's writing during the learning process. Correlation between implementation the PBL model with students' creative attitudes on chemical bonding material has a relationship level in the strong category. From the t-test, the results are positive and the significance value is smaller than the real level, so it can be said that the implementation of the PBL model affects the creative attitude of class X IV students on chemical bonding material.

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REFERENCES

[1] N. N. Simamora, W. A. Putri, M. Iqbal, A. Ramadhanti, and E. F. S. Rini, "Description of Student Discipline Attitudes at SMP Negeri 16 Jambi City," *Lensa J. Kependidikan Fis.*, vol. 8, no. 2, p. 76, 2020, doi: 10.33394/j-lkf.v8i2.3175.

[2] W. A. Putri, R. Fitrini, E. F. S. Rini, F. T. Aldila, and T. Ratnawati, "Pengaruh Motivasi Terhadap Hasil Belajar Siswa IPA di SMAN 6 Muaro Jambi," *SAP (Susunan Artik. Pendidikan)*, vol. 5, no. 3, 2021.

[3] E. F. Setiya Rini, R. Fitriani, W. A. Putri, A. A. B. Ginting, and M. M. Matondang, "Analisis Kerja Keras dalam Mata Pelajaran Fisika di SMAN 1 Kota Jambi," *SAP (Susunan Artik. Pendidikan)*, vol. 5, no. 3, pp. 221–226, 2021, doi: http://dx.doi.org/10.30998/sap.v5i3.7764.

[4] E. F. Setiya Rini, D. Darmaji, and D. A. Kurniawan, "Identifikasi Kegiatan Praktikum dalam Meningkatkan Keterampilan Proses Sains di SMPN Se-Kecamatan Bajubang," *Edukatif J. Ilmu Pendidik.*, vol. 4, no. 2, pp. 2476–2481, 2022.

[5] M. M. Matondang, E. F. Setiya Rini, N. D. Putri, and F. Yolvianysah, "Uji Perbandingan Motivasi Belaajar Siswa Kelas XI MIPA 2 dan XII MIPA 2 di SMA Negeri 1 Muaro Jambi," *J. Sains dan Pendidik. Fis.*, vol. 16, no. 03, pp. 218–227, 2021, doi: https://doi.org/10.35580/jspf.v16i3.15553.

[6] E. F. Setiya Rini, "Pengaruh Kemandirian terhadap Prestasi Belajar Siswa Kelas XI di SMA Negeri 11 Kota Jambi," *J. Pendidik. Fis. dan Teknol.*, vol. 6, no. 2, pp. 256–263, 2020.
[7] R. S. Dewi, Haryono, and S. B. Utomo, "Upaya Peningkatan Interaksi Sosial dan Prestasi Belajar Siswa dengan Problem Based Learning pada Pembelajaran Kimia Pokok Bahasan Sistem Koloid di SMA N 5 Surakarta Tahun Pelajaran 2011/2012," *J. Pendidik. Kim.*, vol. 2, no. 1, pp. 15–20, 2013.
[8] E. Eliyarti and C. Rahayu, "Deskripsi Efektivitas Kegiatan Praktikum Dalam Perkuliahan Kimia Dasar Mahasiswa Teknik," *Edu Sains J. Pendidik. Sains Mat.*, vol. 7, no. 2, pp. 51–60, 2019, doi: 10.23971/eds.v7i2.1476.
[9] A. A. S. N. A. Pucangan, S. K. Handayanto, and H. Wisodo, "Pengaruh Scaffolding Konseptual dalam Problem Based Learning terhadap Kemampuan Pemecahan Masalah," *J. Pendidik. Teor. Penelitian, dan Pengemb.*, vol. 3, no. 10, pp. 1314–1318, 2018.
[10] D. Darmaji, D. A. Kurniawan, A. Astalini, and E. F. S. Rini, "Science Processing Skill and Critical Thinking: Reviewed Based on the Gender," *Juenal Pendidik. Indones.*, vol. 11, no. 1, 2022, doi: http://dx.doi.org/10.23887/jpi-undiksha.v11i1.35116.
[11] E. W. Laksono, Suyanta, and I. Rizky, "Problem-based learning implementation to develop critical thinking and science process skills of madrasah Aliyah students in yogyakarta," *J. Phys. Conf. Ser.*, vol. 1097, no. 1, 2018, doi: 10.1088/1742-6596/1097/1/012059.
[12] A. Shishigu, A. Hailu, and Z. Anibo, "Problem-based Learning and Conceptual Understanding of College Female Students in Physics," *Eurasia J. Math. Sci. Technol. Educ.*, vol. 14, no. 1, pp. 145–154, 2018, doi: 10.12973/ejmste/78035.
[13] D. Chen, R. Fitriani, S. Maryani, E. F. Setiya Rini, W. A. Putri, and A. Ramadhanti, "Deskripsi Keterampilan Proses Sains Dasar Siswa Kelas VIII Pada Materi Cermin Cekung," *PENDIPA J. Sci. Educ.*, vol. 5, no. 1, pp. 50–55, 2021, doi: 10.33369/pendipa.5.1.50-55.
[14] Kholilah, A. Ramadhanti, R. Fitriani, E. Febri, and M. R. Pratiwi, "Hubungan Kerja Keras Dan Hasil Belajar Fisika Di Sma Negeri 1 Kota Jambi," *J. Sci. Educ. Pract.*, vol. 4, pp. 41–48, 2020
[15] A. Ramadhanti, K. Kholilah, R. Fitriani, E. F. S. Rini, and M. R. Pratiwi, "Hubungan Motivasi Terhadap Hasil Belajar Fisika Kelas X MIPA di SMAN 1 Kota Jambi," *J. Eval. Educ.*, vol. 3, no. 2, pp. 60–65, 2022.
[16] N. W. Idris, Usman, and Subaer, "Pengaruh Model Pembelajaran Berbasis Masalah Terhadap Kemampuan Berpikir Kritis Peserta Didik," *J. Sains dan Pendidik. Fis.*, vol. 16, no. 1, pp. 39–50, Aug. 2020.
[17] Ricky Purnama Wirayuda Rimi Wandai and A. A. B. Ginting, "Hubungan Sikap Siswa Terhadap Hasil Pembelajaran Fisika SMA N 1 Kota Sungai Penuh," *Integr. Sci. Educ. J.*, vol. 3, no. 1, 2022.
[18] R. P. D. D. Wirayuda and D. A. Kurniawan, "Identification of Science Process Skills and Students' Creative Thinking Ability In Science Lessons," *Attract. Innov. Educ. J.*, vol. 4, no. 1, 2022.
[19] D. Darmaji, A. Astalini, D. A. Kurniawan, and F. T. Aldila, "Gender and Perception: Implementation of Web-based Character Assessment in Science Learning," *J. Educ. Res. Eval.*, vol. 6, no. 1, 2022.
[20] F. T. Aldila, M. M. Matondang, and L. Wicaksono, "Identifikasi Minat Belajar Siswa Terhadap Mata Pelajaran Fisika Di Sman 1 Muaro Jambi," *J. Sci. Educ. Pract.*, vol. 4, no. 2, 2020.
[21] F. Yolvianysah, Suryanti, E. F. Setiya Rini, S. Wahyuni, and M. M. Matondang, "Hubungan Minat Belajar Siswa Terhadap Hasil Belajar Fisika di SMAN 3 Muaro Jambi," *Tunjuk Ajar J. Penelit. Ilmu Pendidik.*, vol. 4, no. 1, 2021.
[22] Sugiyono, *Metode Penelitian dan Pengembangan*. Bandung: Alfabeta, 2015.
[23] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R & D*. Bandung: Alfabeta, 2013.
[24] Fatonah, U., Wirayuda, R. P., Wibisono, G., & Sakahuni, S. (2020). Analisis Minat Belajar Kelas Xi Sma Negeri 1 Sungai Penuh Pada Pembelajaran Fisika. *Jurnal Sains dan Pendidikan Fisika*, *16*(2), 145-152.