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The Effect of Problem-Based Learning Model in Information Technology Intervention on Communication Skills

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Abstract: Communication skills need to be improved during learning. However, the learning process in schools has not fully implemented learning models that can improve students' communication skills. Learning in schools is still teacher-centered, lack of use of Information Technology (IT), students' inactivity, and their lack of interest in learning in class. The solution is to apply the PBL learning model in IT interventions. The research objective was to develop students' communication skills. The instrument used was a rubric to assess communication that had been validated by experts. The research design was Randomized Control Group Posttest Only Design. This type of research is a quasi-experimental. The data were analyzed by using the two-way ANOVA test. The results showed that there was a significant difference between the PBL learning model and the information technology intervention on the communication skills of students with an average score of 64.27% in the experimental class and 57.70% in the control class and a significant value of 0.00.

Abstrak: *Keterampilan komunikasi perlu ditingkatkan selama pembelajaran. Namun proses pembelajaran di sekolah belum sepenuhnya menerapkan model pembelajaran yang dapat meningkatkan kemampuan komunikasi siswa. Pembelajaran di sekolah masih didominasi oleh guru, kurangnya pemanfaatan Teknologi Informasi (TI), tidak aktif, dan kurangnya minat belajar di kelas. Solusinya adalah dengan menerapkan model pembelajaran PBL dalam intervensi TI. Tujuan penelitian ini adalah untuk mengembangkan keterampilan komunikasi siswa. Instrumen yang digunakan berupa rubrik untuk menilai komunikasi yang telah divalidasi oleh para ahli. Jenis penelitian ini adalah eksperimen semu. Desain penelitian ini adalah Randomized Control Group Posttest Only Design. Analisis data menggunakan uji Anova dua arah. Hasil penelitian menunjukkan bahwa terdapat perbedaan yang signifikan antara model pembelajaran PBL dan intervensi teknologi informasi terhadap keterampilan komunikasi siswa dengan nilai rata-rata 64,27% pada kelas eksperimen dan 57,70% pada kelas kontrol dan nilai signifikansi 0,00.*

Keywords: *Problem-Based Learning, Information Technology, Communication Skills.*

INTRODUCTION

The world of education has been in the era of the 21st century. Therefore, learning also follows the demands of 21stcentury competencies. One of the 21st century competencies is communication competence. Communication is important during the learning process because by communicating students can stimulate their brains in imitating the use of sentences, learning how to convey information that is easy to understand. The ability of students is closely related to the use of Information Technology (IT) as a supporter in the learning process (Kemendikbud, 2018). IT can change the world of education to be more advanced and the mindset of humans to be wiser and be more intellectual from various aspects (Iswan, 2018).21st century learning that is intervened by IT serves to train students to be skilled in problem solving, to be able to express ideas clearly, be able to work efficiently both individually and in groups, and to be able to provide meaning in learning (Zulhilyah, 2013). Different learning processes are able to make students' attention in understanding learning, (Lufri, Fitri, & Yogica, 2018).

One of the 21st century competencies that must be achieved is communication. Student communication needs to be developed in the learning process. However, the learning process in schools has not fully implemented learning models that develop the competencies needed by the 21st century students. Based on interviews with a biology teacher of class XI MIA SMAN 7 Padang, information was obtained that learning is still predominantly teacher-centered. In addition, the lack of variety in learning models makes students bored, inactive, and lacks interest in learning in class so that they cannot hone and develop communication skills during discussions whereas through discussion students can expand their knowledge (Alberida, Lufri, & Berlian, 2018). Based on the authors' observations in class XI MIA 3, many students were not interested in reading and are not active in group collaboration. When one group performed in front of the class, the other students did actively ask questions or express their opinions and ideas so that learning became unpleasant. This showed the lack of communication skills of students during discussions.

The purpose of this study is to see how significant the influence of the PBL model with the intervention of information technology on communication skills is. The solution in overcoming these problems is to improve communication skills through learning models. The model applied is PBL which is intervened with the use of IT. With the PBL model, students are trained with contextual problems. The PBL model can develop students' communication skills in interactive discussions through groups, and peers. Based on previous research by Sudiyanto, et al (2018), learning by applying the PBL model can improve LIS-4C abilities, one of which is the communication skills of students compared to the Think Pair Share model. The study discusses the importance of learning in the 21st century era by using 21st century learning models and using information technology in the form of phones so that they can do communication.

METHOD

The type of the research was a quasi-experimental. There were two groups of students involved in the research. The experimental class was given treatment using the PBL model with Information Technology (IT) intervention, while the control class used conventional learning. The experimental class was given Student Worksheet (LKPD) containing problems so that students could discuss using it to solve the problems. Learning process was accompanied by the help of information technology. Information technology used in learning was in the form of mobile phones used to access learning materials on the internet. The goal was to make it easier for students to find relevant sources such as journals, articles and other valid sources. The research design was *Randomized Control Group Post-test Only*

Design (Lufri & Ardi, 2007). The population of the research was all students of class XI MIA SMAN 7 Padang registered in the 2019/2020 Academic Year. The research population can be seen in Table 1.

Table 1. Population Class XI MIA SMAN 7 Padang Academic Year 2019/2020

Class	Number of the Student	Average Score of Daily Test
XI MIA 1	36	65.07
XI MIA 2	34	67.02
XI MIA 3	33	64.57
XI MIA 4	36	69.58
XI MIA 5	36	66.27
XI MIA 6	33	69.72

Determination of the sample was done by applying cluster random sampling technique, namely taking the sample (classes) randomly from six homogeneous classes. To ensure the similarity of the class average, a one-way ANOVA test was carried out. To see the average similarity, the Final test scores of Biology from grade XI MIA SMAN 7 Padang were used. Before carrying out the one-way ANOVA test, the analysis requirements were first checked, namely the normality of the data and the homogeneity of variance. Data processing was done with SPSS 20 software.

a. Normality Test

Based on the results of the analysis, the six classes of the population were normally distributed as shown in Table 2.

Table 2. Normality Test

Class	Kolmogorov-Smirnov[a]	Information
	Sig.	
XI MIA 1	0.065	Normally Distributed Data
XI MIA 2	0.098	
XI MIA 3	0.070	
XI MIA 4	0.052	
XI MIA 5	0.060	
XI MIA 6	0,062	

From Table 2, it can be seen that the value of Sig. for each class is greater than the level of significance (α = 0.05). Thus, it can be concluded that the population was normally distributed.

b. Homogenity Test

The results of the homogeneity test can be seen in Table 3.

Table 3. Homogenity Test
Test of Homogeneity of Variances

Value

Levene Statistic	df1	df2	Sig.
1.607	5	202	.160

The test criteria accepted since H_0 if sig. > level (α = 0.05) and H_0 was rejected otherwise. From the results of the homogeneity of variance test, the value of Sig. = 0.160. The value of Sig. was greater than the level of significance (α = 0.05). Thus, it could be concluded that the population was homogeneous.

c. Average Similarity Test

The results of the average similarity test can be seen in Table 4.

Table 4. Average Similarity Test
Anova

VALUE

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	838.243	5	167.649	.731	.601
Within Groups	46342.521	202	229.418		
Total	47180.764	207			

The results of one-way ANOVA obtained the value of Sig. = 0.601. Because the value of Sig. was greater than the level of significance (α = 0.05), it could be interpreted that the population data had the same mean scores. Then the sampling was done by drawing lottery using a roll of paper. The results were: first class that was taken was class XI MIA 6 which was designated as the experimental class and the second class that was taken was class XI MIA 4 as the control class.

Data communication skills used a two-way ANOVA test. The ANOVA test was carried

out with the help of SPSS version 20 software. The instrument used was a communication skill rubric that had been validated by experts. The rubric of communication skills can be seen in Table 5.

Table 5. Communication Skills Rubric

Aspect	Criteria	Score
Speak in a clear voice (Max score=4)	Presenting the results of the discussion in a clear voice and using Indonesian.	4
	Presenting the results of the discussion in a clear voice but using incorrect Indonesian.	3
	Presenting the results of the discussion in an unclear voice and using Indonesian.	2
	Do not present the results of the discussion in a clear voice and do not use Indonesian.	1
Making eye-contact with the audience (Max score=4)	Present seriously, make eye contact with the audience	4
	Serious presentation, but doesn't make eye contact with audience (bows down)	3
	Presentation is not serious, laughs during presentation	2
	Presentation is not serious and does not make eye contact with the audience	1
Using multiple sources to express ideas (Max score=4)	Filling out LKPD with multiple sources (more than 3 journals)	4
	Fill out LKPD with several sources (only 3 journals)	3
	Fill out LKPD with sources (less than 3 journals)	2
	Not filling out LKPD with journal sources.	1
Giving an explana-tion of the conclusion (Max score=4)	Explaining the conclusion of the discussion with the appropriate ideas in the scope of the material	4
	Explaining the conclusion of the discussion with ideas that are quite appropriate in the scope of the material	3
	Explaining the conclusion of the discussion with ideas that are not appropriate in the scope of the material	2
	Not explaining the conclusion of the discussion	1
Participat-ing in group present-ation (Max score=4)	Responding to audience questions with clear and appropriate explanations in the scope of the materials	4
	Responding to audience questions with explanations that are clear enough and quite appropriate in the scope of the materials	3
	Responding to audience questions with explanations that are not clear and do not fit within the scope of the materials	2
	Not responding to audience questions with explanations that are not clear and do not fit within the scope of the material	1

Completing the communication skill assessment observation sheet was done during learning processes. The assessment of the student communication skills was calculated using the following formula.

$$\frac{Total\ score}{Maximum\ scores}\ x\ 100\%$$

The technique of collecting data on student communication skill assessments was doing observation by the observer team in students' making presentations in front of the class. The observer team consisted of four people The observation activity was carried out for four meetings, with the topic of motion systems.

RESULTS AND DISCUSSION

The results of the research for the average competence of the 21st century can be seen in Table 6.

Table 6. Average Scores of Sample Class Communication Skills

Class	KD (Basic Competence)	N	Average	SD
Experiment	3.5 Motion System	32	63.46	4.25
Control		35	57.42	3.78
Experiment	3.6 Circulation system	32	65.09	4.31
Control		35	57.98	3.73

Table 7.Two-Way ANOVA Hypothesis Test for Motion Movement System

Hypothesis Test				
Parameter	**Mean Square**	**F**	**Sig.**	**Explanation**
Treatment	6878.65	327.22	0.00	Significant

Table 8.Two-Way ANOVA Hypothesis Test for Motion Circulation System

Hypothesis Test				
Parameter	**Mean Square**	**F**	**Sig.**	**Explanation**
Treatment	4142.66	215.37	0.00	Significance

The hypothesis test results of the significance value of communication skills was 0.00 < 0.05 which indicated that the learning with the PBL model intervened by information technology had a significant effect on communication skills in the materials of Movement System, and Circulation System.

Communication skills are one of the supporters in the learning process (Septiani, Syamsurizal, & Darussyamsu, 2018). In this study, students' communication skills were measured by observation sheets during the learning process which were observed by four observers. In this communication activity, the aspects assessed were speaking in a clear voice, making eye contact with the audience, using multiple sources to express ideas, providing explanations for conclusions, and participating in group presentations. The students' communication skills needed to be assessed because this assessment looked at how students express-ed their ideas and opinions during learning. That's why the students were trained to be active in the classroom as in accordance with the demands of 21stcentury learning.

The students' communication skills were assessed by four observers using a rubric that had been designed by the researchers. When learning in class the teacher gave the student worksheet (LKPD) to each group. Then, each group discussed using the LKPD to solve the problems in it. Students were also directed to search for resources via the internet using cell phones. Students' communication skills need to be improved through education in order to prepare students in the context of facing technological changes and rapidly developing social changes. Communication is the most important thing that humans need to adapt to the environment (Aydin, 2015). Communication skills can be defined as message transmission that involves a shared understanding between the contexts in which communication takes place. It is a dynamic process that requires the mind and courage to confront the other and convey the message in an effective way. The communication process is successful when a message is delivered in a way that is clear and easy to understand.

Good communication is considered a powerful tool for effective teaching profession. Communication skills include listening and speaking as well as reading and writing (Khan, Khan, & Khan, 2017). One of the ways used by the University of Winneba, Ghana to improve students' communication skills is to provide learning that can stimulate communication skills. Learning provides opportunities for students to seek knowledge and communicate the knowledge they have acquired, for example, through presentations. The basis of communication skills is effective speaking, writing and reading and as the bases of human language learning (Asemanyi, 2015).

The experimental class's communication skills were better than the control class because the experimental class applied the PBL model with the interference of information technology. With the PBL model, students could discuss well among their group members so that good communication was created. Communication takes place reciprocally between students and teachers, teachers and students, and fellow students (Zulhilyah, 2013). The indicators of communication skills are (1) speaking in clear voice, (2) making eye contact with the audience, (3) using multiple sources to express ideas, (4) providing explanations for conclusions, and (5) participating in group presentations (Taryono, 2016).

Based on the research of Kodariyati & Astuti (2016), PBL model has a significant effect on mathematical communication skills. Iftitahurrahimah (2020) pointed out that there was an effect of the PBL model on students' oral communication skills. The results of research of Rangkuti & Fitriani, (2019) showed that there was a significant difference in mathematical communication skills between PBL and PJBL learning approaches.

CONCLUSION

It can be concluded that the PBL model which is intervened by information technology has a significant effect on the communication skills of class XI at SMAN 7 Padang. The communication skills of students have increased with the treatment. Group discussion activities and problem-based learning provided by the teacher can provide wider opportunities for students to solve problems and improve their communication skills.

Based on the conclusions, the obtained findings showed that it could be used as recommendations for teachers, in order to apply the PBL learning model that is intervened by information technology as an effort to develop 21st century competencies, one of which is the communication skills of students.

REFERENCES

Alberida, H., Lufri, L., & Berlian, F. (2018). Problem Solving Model for Science Learning. *IOP Conference Series: Materials Sciences and Engineering*, *335*(1).

Asemanyi, A. A. (2015). An Assessment of Students' Performance in Communication Skills: A Case Study of the University of Education Winneba. *Journal of Education and Practice*, *6*(35), 1–7.

Aydin, A. D. (2015). Assessment of Communication Skills of Physical Education and Sport Students in Turkish Universities. *Universal Journal of Educational Research*, *3*(11), 943–948.

Iftitahurrahimah, I. (2020). Pengaruh Model Problem Based Learning (PBL) terhadap Kemampuan Komunikasi Siswa Materi Pokok Larutan Elektrolit dan Non-Elektrolit. *Jurnal Pijar MIPA*, *15*(1).

Iswan, H. (2018). Penguatan Pendidikan Karakter Perspektif Islam dalam Era Milenial IR. 4.0. *Jurnal Pendidikan*.

Kemendikbud. (2018). *Modul Pelatihan Implementasi Kurikulum 2013*. Badan Pengembangan Sumber Daya Manusia Pendidikan dan Budaya dan Penjamin Mutu Pendidikan.

Khan, A., Khan, S., & Khan, M. (2017). *Communication Skills of a Teacher and Its Role in the Development of the Students' Academic Success*. *8*(1), 18–21.

Kodariyati, L., & Astuti, B. (2016). Pengaruh model PBL terhadap kemampuan komunikasi dan pemecah masalah matematika siswa kelas V SD. *Jurnal Prima Edukasia*, *4*(1), 93–106.

Lufri, & Ardi. (2007). *Metodologi Penelitian: Penelitian Kuantitatif, PTK dan Penelitian Pengembangan*. Padang: UNP Press Padang.

Lufri, L., Fitri, R., & Yogica, R. (2018). Effectiveness of Concept-Based Learning Model, Drawing and Drill Methods to Improve Students' Ability to Understand Concepts and High-Level Thinking in Animal Devlopment Course. *Journal of Physics: Conference Series*, *11*(6).

Rangkuti, A. N., & Fitriani, F. (2019). Pengaruh Pendekatan Pembelajaran PBL dan PjBL terhadap Kemampuan Komunikasi Matematis Mahasiswa pada Mata Kuliah Statistik. *Ta'dib*, *22*(2).

Septiani, V., Syamsurizal, & Darussyamsu, R. (2018). Peningkatan Kompetensi Keterampian Peserta Didik dengan Model Penerapan Strategi Learning Community melalui Model Pembelajaran Jigsaw pada Materi Sistem Penceraan Manusia Kelas VIII di SMPN 12 Padang. *Journal Bioeducation*, *1*(2).

Taryono, T. (2016). *Penerapan Pembelajaran Berbasis Proyek dan Pembelajaran Berbasis Masalah pada Mata Pelajaran Fisika untuk Meningkatkan Keterampilan Abad 21 (4Cs) Siswa SMP*. Retrieved from repository.upi.edu

Zulhilyah. (2013). *Pengaruh Metode Pembelajaran Creative Problem Solving terhadap Keterampilan Berpikir Kreatif dan Komunikasi dalam Pembelajaran IPS*. Retrieved from repositori.upi.edu