



## IMPLEMENTATION PROBLEM BASED LEARNING ON IMPROVING ACTIVITY AND PSYCHOMOTORIC STUDENTS VOCATIONAL HIGH SCHOOL

Endri Triwiyono<sup>1</sup>, Bernardus Agus munadi<sup>2</sup>

<sup>1,2</sup>Mechanical Engineering Education, Universitas Negeri Yogyakarta

Email: [endri.t@uny.ac.id](mailto:endri.t@uny.ac.id)

### KEYWORDS

Problem-based learning  
Activities  
Psychomotor aspects  
Learning outcomes

### ABSTRACT

This study aims to improve the learning activity and psychomotor ability of Vocational High School (SMK) students in Metal Fabrication Technique on oxyacetillin welding study by using Problem-Based Learning (PBL) method according to Curriculum 2013. The research method uses action research research in two cycles, while each cycle consists of four stages: planning, execution, observation, and reflection. Data was collected using observation method with checklist instrument and rating scale while data was analyzed descriptively. The results showed as follows: 1) the application of PBL method on the learning of Oksi Asetilin Laser can increase student learning activity by 11,20%; 2) improvement of learning result of psychomotor aspect after applying Problem Based Learning by 20,20% with psychomotor aspect ability level that is work preparation and use of tool, systematics and work method, work result, work attitude and speed of doing work (time); 3) after the application of PBL the number of students who reached the Minimum Exhaustiveness Criteria (KKM) on the cognitive aspect learning outcome of 91.31%; and 4) Problem Based Learning is aligned with the scientific approach of the Curriculum 2013.

### INTRODUCTION

Education is the foundation of human formation in the mastery of science and a way of life is good and true to realize the nation's people are solid and capable of self-reliance. Implementation of education in Vocational High School (SMK) that has not been optimal becomes an important issue for the government to continue to improve the quality of education implementation in accordance with the objectives. This is evident from the open unemployment rate per August 2017 where the unemployed vocational graduates are 12.59 million people or 10.40% of the total unemployment is open ([www.bps.go.id](http://www.bps.go.id)).

Based on the fact that the government is doing efforts to improve the quality of SMK through the revitalization of SMK (Inpres No. 9 of 2016) wrapped in the implementation Curriculum 2013 which is currently running. These efforts not only touch the physical and explicit instruction of the president to 12 ministries, but on the learning process is implemented.

Learning in SMK aims to prepare students to enter the workforce and be able to compete in today's job market where conditions are constantly changing as global change and technology are present. As a potential employee, students are faced with uncertainty and rapidly changing technology (Thornburg, 2002). Seeing these conditions would require learning that not only equip students basic skills but also able to adapt to changes that exist. The fact is that if

you look at the national standard of education and vision 2025, the quality of existing learning has not been optimal (ditpsmk.co.id).

The Curriculum 2013 lesson directed towards a scientific approach has not been fully implemented. Teachers are still having difficulties in the application so that until now lessons have not changed much (Herminarto Sofyan, et al: 2014). The learning process has not embed the clear concepts and principles which resulted in how to analyze the problem is still low so that the mastery of the material is also not optimal (Abdullah, 2013). The results of the field survey conducted on the productive subjects of oxy acetilin (OAW) showed that the material about oxy acetylene welding is still considered difficult and complex. Evaluation given by the teacher in the form of test is not yet effective enough to help understanding both facet of knowledge and cognitive process of student. During this time the students are only fixated on the process of practice without giving the problems that occur in the real world in general and the results of the previous semester test is still low. The ability to think and knowledge can be given by giving teachers experience learning to real problems that are poured into the method learning (Rusmono, 2012: 74). The real problem is certainly more complex than the simplification in the learning that is directly indeed limited. One of the learning methods applied and in line with the thinking of the 2013 curriculum is Problem-Based Learning (PBL) or problem based learning (Herminarto Sofyan, et al: 2014). Problem Based Learning model of learning is a method of learning by applying the problem as a first step in collecting and integrating new knowledge (Boud & Felletti: 1991). Problem Based Learning prepares students to develop psychomotor skills including work preparation and use of tools, the ability to analyze sequentially (systematically and work), work results, work attitude and speed of doing work (time) (Leighbody & Kidd: 1968).

Problems as the basic learning process in solving the problem correctly and correctly. Starting from the problem students are encouraged to learn concepts and procedural or principles in studying and analyzing problems. From this it will form old knowledge shifted to new knowledge means active thinking has taken place in the learning cycle of welding oksidasi acetylene. Based on the above problems, Problem Based Learning should be applied as an effort to improve learning in SMK. The increase that will be measured is in the psychomotor realm of learning Oxy Acetilin (OAW).

## RESEARCH METHODS

This research uses Classroom Action Research method. Selection of this method in order to improve teaching and learning process and is expected to also improve the program and learning model that has been running in SMK In accordance with the curriculum 2013. Design of classroom action research using Kemmis & Mc model. Taggart.

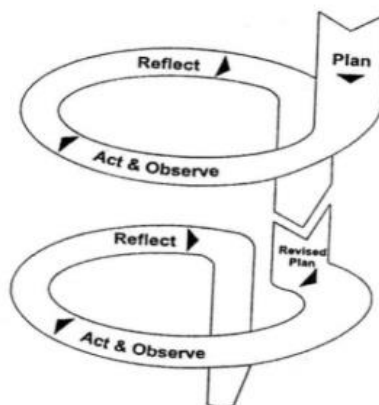


Figure 1. Research Design Action Class Kemmis & Taggart (Kemmis & Taggart: 1988)

Consisting of four cycles / stages include: planning process, action, observation, and reflecting (Pardjono, 2007: 22). PBL implementation is done in two cycles. Data collection through prestes and posttest and observations made by the observer. Location Research conducted in SMK N 1 Seyegan Metal Fabrication Department.

## RESULTS AND DISCUSSION

Data obtained in the form of student activity data and the ability of learning outcomes are psychomotor aspects on the practice of welding oksidasi acetylene. Classroom action research that has been implemented consists of 2 (two) cycles

with stages are: 1) planning; 2) implementation; 3) observation; 4) reflection. Student activities in learning are assessed based on the participation of students in the process of implementing Problem Based Learning learning that is involvement in apperception, data tracking, discussion, problem solving and presentation. The result showed that student activity (Table 1) increased in all its aspects with the average of 11.22%. The greatest aspect is increased in aspects of problem solving by students. While the lowest increase in student discussion.

Table 1. Student Activities

No	Aspect	Cyclus	Cyclus	Gain
		1 (%)	2 (%)	
1	Aperseption	60,3	72,4	12,1
2	Exploration	55,4	67,6	12,2
3	Discussion	64,2	68,9	4,7
4	Problem Solve	43,1	65,1	22
5	Presentation	65,5	70,6	5,1
	Average	57,7	68,92	11,22

Source: private document

Psychomotor aspect is done through observation and assessment of weld product. The results of the assessment showed an increase in some aspects of psychomotor skills such as work preparation and use of tools 81% increased by 11%, the ability to analyze sequentially (systematically and work) 84% increased 11%, 83% employment increased 9%, 82% 9% and the speed of doing the job (time) 77% increased 2%. The average of psychomotor ability is 81,4% with the improvement of students who pass according to Minimum Criterion (KKM) 93,20%.

Table 2. Increased Learning Outcomes Psychomotor Aspects

No	Psycomotor Aspect	Cyclus I (%)	Cyclus II (%)	Gain (%)
1	Preparation	70	81	11
2	Sistematic of the way	73	84	11
3	Product	74	83	9
4	Attitude	73	82	9
5	Time of work	75	77	2
	Average	73	81,4	8,4
	Minimum Criterion (KKM)	80	93,20	13,2

Source: private document

Increased learning outcomes psychomotor aspects of cycle II associated with increased mastery of the implementation of learning in Problem Based Learning. In addition, in cycle II, students are actively involved in the implementation of Problem Based Learning. The existence of such activeness, improving skills controlled by students. Problem Based Learning method can improve the quality of learning, as evidenced by the activeness of students during the learning process. This is in line with what was revealed by Muhson (2009: 171) that Problem Based Learning is a method of learning to use problems as a first step in collecting and integrating new knowledge, focusing on the learner activity that is expected to develop their own knowledge. In line with the paradigm shift in the learning process from teacher-oriented, become student-oriented learning, the Problem Based Learning model can answer the problem.

Some critical notes of the implementation of Problem Based Learning in the implementation of Curriculum 2013 is basically schools and teachers have considerable potential in implementing Problem Based Learning. Teachers also showed positive perceptions of Problem Based Learning and stated that Problem Based Learning has advantages in improving students' ability in activity and psychomotor aspects. In line with the objective of applying the 2013 curriculum, the development of learning model with Problem Based Learning aims to improve students' competency holistically and integratively in knowledge, attitude and skill aspects. There are five main stages of learning with Problem Based Learning model that is student orientation to problem, arrange student to learn, guide individual and group research, develop and present work result, and analyze and evaluate problem solving process. There is a harmony between the scientific approach of Curriculum 2013 with Problem Based Learning, so it can be integrated in the implementation of Curriculum 2013 (Herminarto Sofyan, et al: 2014). Problem Based Learning will be easier to apply when supported with material, media, and complete teaching assistance. With materials, media, and teaching aids complete then the teacher will be free to design problems in accordance with the characteristics of students. Thus the ability of teachers in developing learning materials, media, and teaching materials is one key to the success of the implementation of Problem Based Learning.

## CONCLUSION

Problem Based Learning becomes one of the efforts of applying scientific approach in Curriculum 2013 which is considered not optimal yet. Implementation of Problem Based Learning in the subjects of Oxy Las Accetilin able to increase student learning activity 11.22%. aspects of psychomotor ability such as work preparation and use of tools 81% increased 11%, ability to analyze sequentially (systematically and work) 84% increased 11%, 83% employment increased 9%, work attitude 82% increased 9% (time) 77% increased 2%. The average of psychomotor ability is 81,4% with the improvement of students who pass according to Minimum Criterion Criterion (KKM) 93,20%. This shows that increased student activity has an effect on improving cognitive ability. SMK has big enough potential to implement Problem Based Learning as one of the methods in the implementation of Curriculum 2013. Problem Based Learning is considered in harmony and in accordance with the scientific approach of Curriculum 2013. Implementation of Problem Based Learning will be helped by the material, media and tools as complete as supporting learning.

## REFERENCE

- Badan Pusat Statistik. (2017). *Keadaan Ketenagakerjaan Indonesia Agustus 2017*. [www.bps.go.id](http://www.bps.go.id). Accessed on 11 Desember 2017 at 12.30.
- Boud, D., & Feletti, G. (1997). *The challenge of problem-based learning* (2<sup>nd</sup> ed.). London: Kogan Page.
- Direktorat Pembinaan SMK. (2017). *Target Capaian SMK 2020*. <http://psmk.kemdikbud.go.id>. Accessed on 12 Desember 2017 at 20.10.
- Herminarto Sofyan, Wagiran, dan Kokom Komariah. (2014). *Pengembangan Model pembelajaran Problem based Learning dalam penerapan Kurikulum 2013 di SMK*. Laporan Penelitian.
- Kemmis & Taggart. (1988). *Action Research and The Critical Analysis of Pedagogy*. Geelong: Deakin University.
- Leighbody, Gerald B dan Kidd Donald M. (1968). *Methods of Teaching Shop and Technical Subjects*. New York: Delmark Publisher.
- Lukmanul Hakim Abdulah. (2013). *Sistem Penilaian dalam Kurikulum 2013: Kajian Dokumen Terhadap Kurikulum 2013*. [www.Academia.edu](http://www.Academia.edu). Diakses pada 8 Oktober 2017.
- Muhson. A. (2009). *Peningkatan Minat Belajar dan Pemahaman Mahasiswa Melalui Penerapan Problem Based Learning*. *Jurnal Keendidikan*, 39 (2) , 171 -182.
- Pardjono, dkk. (2007). *Panduan penelitian tindakan kelas*. Yogyakarta: Lembaga Penelitian Universitas Negeri Yogyakarta.
- Presiden Republik Indonesia. (2016). *Instruksi Presiden Republik Indonesia No 9 Tahun 2016 tentang Revitalisasi SMK dalam Rangka Peningkatan Kualitas dan Daya Saing Sumber Daya Manusia Indonesia*. Jakarta: Deputi Bidang Pembangunan Manusia dan Kebudayaan.
- Rusmono (2012). *Strategi Pembelajaran dengan Problem Based Learning*. Bogor: Ghalia.
- Thornburg, D. (2002). *The Basics: Eduation and the Future of Work in the Telematic Age*. Alexandria,VA: Asodiation for Supervision and Curriculum Development.