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THE EFFECTIVENESS OF PROBLEM-BASED LEARNING METHOD IN THE IMPLEMENTATION OF 2013 CURRICULUM AT VOCATIONAL HIGH SCHOOL

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Abstract: *This study aimed to describe the initial conditions of learning in the application of the 2013 Curriculum and learning conditions after implementing problem-based learning. This research was part of the development of a problem-based learning model in implementing the 2013 curriculum. The sample in this study was 19 teachers who applied problem-based learning in implementing the 2013 curriculum at Vocational High School I Nur Hasanah, North Sumatra. Data was collected using a questionnaire technique through focused group discussion. Data analysis was carried out descriptively. The results of the first year's research showed that: (1) Problem-based learning had the potential to be applied in the implementation of the 2013 Curriculum in Vocational High Schools. Teacher readiness in implementing the 2013 Curriculum was included in the high category with an average price of 96.73 and an achievement score of 82%. The suitability of learning implementation in the application of the 2013 Curriculum was included in the high category with an average of 152.26 and an achievement score of 78%. Most of the teachers stated that problem-based learning was appropriate to be applied in every subject in the implementation of the 2013 Curriculum; (2) Problem-based learning was proven to be able to increase student competency in terms of abilities and attitudes.*

Keywords: *2013 curriculum; Problem-based learning; Vocational high school*

Abstrak: Penelitian ini bertujuan untuk mendeskripsikan kondisi awal pembelajaran dalam penerapan Kurikulum 2013 dan kondisi pembelajaran setelah menerapkan pembelajaran berbasis masalah. Penelitian ini merupakan bagian dari pengembangan model pembelajaran berbasis masalah dalam implementasi kurikulum 2013. Sampel dalam penelitian ini adalah 19 orang guru yang menerapkan pembelajaran berbasis masalah dalam penerapan kurikulum 2013 di SMK I Nur Hasanah Sumatera Utara. Pengumpulan data dilakukan dengan menggunakan teknik kuesioner melalui focused group discussion. Analisis data dilakukan secara deskriptif. Hasil penelitian tahun pertama menunjukkan bahwa: (a) Pembelajaran berbasis masalah berpotensi diterapkan dalam implementasi Kurikulum 2013 di SMK. Kesiapan guru dalam mengimplementasikan Kurikulum 2013 termasuk dalam kategori tinggi dengan rata-rata harga 96,73 dan nilai capaian 82%. Kesesuaian pelaksanaan pembelajaran dalam penerapan Kurikulum 2013 termasuk dalam kategori tinggi dengan rata-rata 152,26 dan skor ketercapaian 78%. Sebagian besar guru menyatakan bahwa pembelajaran berbasis masalah layak diterapkan pada setiap mata pelajaran dalam implementasi Kurikulum 2013; (b) Pembelajaran berbasis masalah terbukti mampu meningkatkan kompetensi siswa dalam hal kemampuan dan sikap.

Kata kunci: Kurikulum 2013; Pembelajaran berbasis masalah; Sekolah menengah kejuruan

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INTRODUCTION

Vocational education, in this case Vocational High Schools which prepare students especially to work in certain fields (Law Number 20 of 2003) has a strategic role in preparing human resources, especially middle-level workers (Fadilla et al., 2021). Field experience and development planning projection data show that in terms of the prospect of need and economic feasibility, vocational education is still a fairly good investment in preparing middle-level skilled workers (Daud & Gunawan, 2019).

The paradigm for developing vocational education in the future is certainly inseparable from the characteristics of the world of work and workforce needed in the coming era (Stevani et al., 2022). From the point of view of vocational education, the fundamental question that needs to be answered is how relevant the learning outcomes produced by the world of education are with the characteristics of the workforce needed in the future (Maba, 2017). Various studies formulate the learning outcomes needed for graduates in facing future employment challenges. The Partnership for 21st Century Skills formulates 21st century student outcomes and support system.

A holistic perspective on learning is needed to create graduates who have comprehensive competencies. These competencies cover aspects of basic abilities (language, art, mathematics, economics, science, geography, history, and citizenship); learning and innovation skills (creativity and innovation, critical thinking, communication, and collaboration); ability to manage information, media, and information technology; as well as life and career skills. When viewed from the dimensions contained in the expected competencies, it is clear that character building is a requirement for graduates to be able to succeed in the future (Dewi et al., 2018).

The implementation of the 2013 Curriculum is one of the government's efforts to further improve the quality of graduates according to educational goals. The 2013 curriculum change is expected to produce productive, creative, innovative, and affective Indonesians through strengthening integrated attitudes (know why), skills (know how), and knowledge (know what). This is in order to welcome the development of life and science in the 21st century, which is experiencing a shift in both characteristics and learning models (Rumahlatu et al., 2016).

Changes to the 2013 curriculum or development of the 2013 curriculum are expected to be able to encourage active and creative students to observe, ask questions, reason, and communicate, what is obtained or known after students receive learning material. Curriculum changes require a change in the learning paradigm from teaching to learning from a teaching community to a learning community (Zulhernanda, 2018). Thus, teachers are required to be creative and innovative in designing learning so that students are motivated and feel happy during learning. Therefore there must be efforts from the teacher how to develop learning so that learning becomes interesting, fun, and motivates students to learn independently (Maskur et al., 2020).

At the operational level, the learning objectives include the development of the domains of attitudes, knowledge and skills which are elaborated for each educational unit. The three competency domains have different acquisition trajectories (psychological processes). Attitude is obtained through the activity of accepting, implementing, appreciating, living, and practicing. Knowledge is acquired through the activities of remembering, understanding, applying, analyzing, evaluating, creating (Oviawe & Uddin, 2020). Skills are acquired through the activities of observing, asking, trying, reasoning, presenting, and creating (Sodik, 2017). Competency characteristics and differences in acquisition trajectories also influence the standard process characteristics

(Permendikbud No. 65 of 2013). To strengthen the scientific approach, integrated thematic (thematic between subjects), and thematic (within a subject) it is necessary to apply discovery/inquiry learning based on discovery/inquiry learning. To encourage students' ability to produce contextual work, both individually and in groups, it is highly recommended to use a learning approach that produces project-based learning. The expected learning approaches/models in the implementation of the 2013 Curriculum include integrated thematic characteristics, scientific approaches, discovery learning, problem based learning, and project based learning (Nurhayati & Samiati, 2018).

Problem-based learning is one of the appropriate models developed in technology learning to respond to issues of improving the quality of technology learning and anticipating changes that occur in the world of work in line with the demands of learning in the application of the 2013 Curriculum. Problem-based learning is a learning strategy that "move" students learn to actively solve complex problems in realistic situations. Problem-based learning can be used for learning at the subject level, subject units, or the entire curriculum (Komariah, 2011). This is in line with the characteristics of problem-based learning as a constructivist learning method oriented towards student centered learning which is capable of fostering a creative, collaborative spirit, metacognitive thinking, developing high-level thinking skills, increasing understanding of meaning, increasing independence, facilitating problem solving, and building teamwork (Sada et al., 2015). Furthermore, some of the characteristics of problem-based learning include: (1) students must be sensitive to their learning environment, (2) the problem simulation used should be ill-structured, and provoke free discovery (free for inquiry), (3) integrated learning in various subjects, (4) the importance of collaboration, (4) learning should foster student independence in solving problems, (5) problem solving activities should represent real situations, (6) assessments should reveal student progress in achieving goals in problem solving, (7) problem-based learning should be the basis of the curriculum, not just learning. Some of the advantages of the problem-based learning method include: increasing understanding of meaning, increasing independence, increasing the development of higher-order thinking skills, increasing motivation, facilitating relationships between students and increasing skills in building teamwork (Nurtanto et al., 2020).

Based on the results of observations on English subject teachers conducted in class IX Semester I at Nur Hasanah Vocational High School I, North Sumatra, there are problems faced by teachers, namely students who have low learning interest and low student learning outcomes. The low student achievement is triggered by many things including the lack of focus on students in learning, lack of motivation in learning and conventional teaching methods. Supposedly, the process of learning why should be packaged in such a way that the child's level of ability is in line with the conditions of the times. For this reason, renewal in terms of process planning must always be carried out in order to straighten and smooth the way for students to find their identity, acquire relevant life knowledge provisions to be utilized in facing the current of globalization which is marked by the rapid development of information technology.

The benefit of this research is that problem-based learning actively involves students. Students do not receive subject matter solely from the teacher, but try to explore and develop their own. Thus, students are more motivated in learning and know the significance of what they learn. The learning outcomes obtained are not only in the form of increased knowledge, but also improve thinking skills. Problem-based learning is also a

learning approach that uses real-world problems as a context for students to learn about critical thinking and problem-solving skills, as well as to acquire essential knowledge and concepts from subject matter (Stevani & Tarigan, 2022).
However, currently there has not been found the right model and formula for the implementation of problem-based learning as a reference for learning, especially in Vocational High Schools. Therefore it is necessary to study the initial conditions of learning in the application of the 2013 Curriculum, and the conditions after the implementation of problem-based learning. The results of this study are expected to be a reference for Vocational High Schools in Indonesia in implementing learning, especially problem-based learning in line with the demands of learning in the Implementation of the 2013 Curriculum. Efforts to formulate the learning model are urgently carried out in an effort to increase the effectiveness of the implementation of the 2013 Curriculum with the formulation of the problem: "How is effectiveness of the problem-based learning method in the implementation of the 2013 curriculum to improve English learning process at vocational high school?"

METODE

This research was a quantitative and qualitative research with descriptive analysis (Yuan et al., 2020). The research sample was 19 teachers at Vocational High School I Nur Hasanah, North Sumatra. The research data was collected using a learning achievement test. The test in this study was used to measure the English learning achievement of students of class IX Semester I of the 2022/2023 Academic Year after implementing problem-based learning method. The test in the research was in the form of a written test in the form of an objective test. The test was in the form of items in accordance with the material that had been taught. The method used to analyze the data from this research was descriptive method (Fahmy et al., 2015). For quantitative data, it was analyzed by finding the mean, median, mode, making class intervals. Data was taken by questionnaire through Focused Group Discussion (FGD).
The procedures for teaching problem-based learning were: (1) The phase of student orientation to the problem: Problems were given in the learning sequence, before preparation or activities take place. Then the teacher helped students define and organize learning tasks related to these problems, (2) Stages of organizing students to learn: The teacher encouraged students to collect appropriate information, carried out experiments to get explanations and problem solving. Then students worked to solve problems that could give them the opportunity to think and use their knowledge, according to their level of learning. (3) The stage of developing and presenting the work: The teacher helped students to plan and prepare appropriate works such as reports, videos and models and helps them share assignments with their friends. the necessary knowledge and skills could be reapplied to the problem to evaluate the effectiveness of learning and reward learning, and (4) The stage of analyzing and evaluating the problem-solving process: Teachers helped students to reflect on or evaluate the investigations and the processes they used. Learning that occured with problems and in individual learning was summarized and integrated into the knowledge and skills students already possessed (Stevani & Tarigan, 2022).

HASIL DAN PEMBAHASAN

Variable data on the implementation of learning with the demands of the 2013 curriculum were obtained using a closed questionnaire with a total of 48 items. The minimum score per item 1 and the maximum score

per item 4 (four alternative answers). Thus, the range of scores assigned to the variable of suitability of learning implementation with the demands of the 2013 curriculum was from 48 to 192, the mean criterion (Mi) was 120 and the criterion standard deviation (SDi) was 24. Based on the research data, the score range was between 115 and 198, the average price (mean) was 152.26, the median was 149, the mode was 149, and the standard deviation was 19,639.

The tendency of the variable data on the suitability of the implementation of learning with the demands of the 2013 curriculum could be seen by comparing the average size of the research results (empirical) with the set criteria average. From the calculation results, the average research data (empirical) was 150.51. This value was greater than the average criterion of 19200. This indicated that the suitability of the implementation of learning with the demands of the 2013 curriculum as a whole was in the above average category. Furthermore, the trend of each of these scores could be divided into five categories which range from 48 to 192. A detailed description was presented in Table 1.

Table. Percentage of Appropriateness of Learning Implementation Variable Scores with the 2013 Curriculum

Interval	Category	Total	Percentage (%)
153.5 - 190	Very high	30	30
132.3 – 152.8	High	78	78
115.6 – 135.2	Moderate	10	10
87.2 – 105.7	Low	-	-
47 – 86.3	Very low	-	-
Total		100	100

Based on the percentage of these variable data, it could be seen that the suitability of learning implementation with the demands of the 2013 curriculum in general tends to fall into the high to very high category. This was in line with the average research results that had been analyzed. Based on the descriptive analysis, it could also be known that the achievement of the variable score of the suitability of learning implementation with the demands of the 2013 curriculum by comparing the total score achieved (empirical) with the highest total score determined. For the variable of suitability of learning implementation with the demands of the 2013 curriculum, a total score of 15051 was obtained and the highest score set was 19200 so that the variable score of the suitability of learning implementation with the demands of the 2013 curriculum reached 78% of the highest score which was determined by the high category.

Aspects of the appropriateness of the implementation of learning in detail in the aspects of the introduction, core activities, and closing could be observed in Table 2 to.d..

Table. Conformity of Learning Implementation with the Demands of the 2013 Curriculum in the Preliminary Aspect

No	Statements	Average	Achievement Score (%)
1	Conveyed the benefits of learning materials	3.35	83
2	Conveyed the abilities that students would achieve	3.27	82
3	Delivered activity plans, such as individual, group work, and making observations	3.36	81
4	Associated current learning material with students' experience or previous learning	3.32	80
5	Demonstrated something related to the theme	3.20	79
6	Asked challenging questions	3.08	76

Table. Top Ten Aspects of Appropriateness of Learning Implementation with Highest Rated

No	Statements	Average	Achievement Score (%)
1.	Adjusted the material with learning objectives	3.25	82
2.	Facilitated students to ask questions	3.25	82
3.	Facilitated students to ask questions	3.25	82
4.	Facilitated students to observe	3.25	82
5.	Demonstrated an open attitude to student responses	3.25	82
6.	Carried out learning in accordance with the competencies to be achieved	3.24	80
7.	Fostered active participation of students	3,24	80
8.	Responded positively to students' active participation	3.24	80
9.	Demonstrated a conducive interpersonal relationship	3.24	80
10.	Grew joy or enthusiasm of students in learning	3.24	80

Table. Top Ten Aspects of Appropriateness of Learning Implementation with the Lowest Value

No	Statements	Average	Achievement Score (%)
1.	Implemented project-based learning	2.85	71
2.	Facilitated students to perform synthesis	2.85	71
3.	Implemented discovery learning	2.85	71
4.	Facilitated students to make interpretations	2.97	74
5.	Applied a scientific approach	2.99	75
6.	Facilitated students to carry out assessments	2.99	75
7.	Facilitated activities that contain exploration, elaboration, and confirmation components	3.05	76
8.	Used projects/activities as media	3.05	76
9.	Provided problems to give students the opportunity to do the problem solving process	3.05	76
10.	Used a variety of learning media	3.05	76

Table. Conformity of Learning Implementation with the 2013 Curriculum Demands on the Closing Aspect

No	Statements	Average	Achievement Score (%)
1	Gave an oral or written test	3.18	80
2	Collected the results of work as portfolio materials	3.15	79
3	Reflected on or made a summary by involving students	3.12	78
4	Implemented authentic assessment	3.06	77
5	Carried out follow-up by providing directions for subsequent activities and enrichment assignments	3.06	77

Based on the data in Table 2 to Table 5, it was found that the implementation of learning in the introductory and closing aspects basically had high suitability, whereas in terms of core activities, the non-compliance aspects generally stem from not having implemented scientific learning, project based learning, discovery, and authentic assessment or project based learning.

The potential for the implementation of problem-based learning in implementing the 2013 Curriculum in Vocational High Schools was obtained through a questionnaire with 10 questions. The full results were presented as follows. First, the understanding of problem-based learning was: (a) 8 people or 42% of teachers stated that they really understand problem-based learning; (b) 7 people or 37% of teachers stated that most of them understood problem-based learning; (c) 4 people or 21% of teachers said they did not understand problem-based learning.

Second, the application of problem-based learning was: (a) 4 people or 21% of teachers stated that they had never implemented problem-based learning; (b) 3 people or 16% of teachers stated that they were just at the stage of trying problem-based learning; (c) 3 people or 16% of teachers stated that they had applied problem-based learning once; (d) 9 people or 47% of teachers stated that they applied problem-based learning more than once.

Third, the understanding of the principles of problem-based learning was: (a) 8 people or 42% of teachers stated that most of them understood the principles of problem-based learning; (b) 11 people or 58% of teachers said they did not understand the principles of problem-based learning.

Fourth, information about problem-based learning was: (a) 8 people or 42% of teachers stated that they had never received problem-based learning socialization; (b) 4 people or 21% of teachers stated that problem-based learning had received socialization either held at school or external parties; (c) 7 people or 37% of teachers stated that they received problem-based learning information from library sources.

Fifth, conformity with the scientific approach was: (a) 15 people or 80% of teachers stated that problem-based learning was in accordance with the scientific approach in implementing the 2013 Curriculum; (b) 4 people or 21% of teachers stated that problem-based learning was lacking or not in accordance with the scientific approach in implementing the 2013 Curriculum.

Sixth, the possibility of implementing problem-based learning was: (a) 16 people or 84% of teachers stated that problem-based learning was

very likely to be applied in the application of the 2013 Curriculum; (b) 3 people or 16% of teachers stated that it was impossible to apply problem-based learning in implementing the 2013 Curriculum.

Seventh, subjects suitable for implementing problem-based learning were: (a) 12 people or 63% of teachers stated that problem-based learning was suitable for all subjects, (b) 5 people or 26% of teachers stated that problem-based learning was suitable to be applied in productive subjects, (c) 2 people or 10% of teachers stated that problem-based learning was suitable to be applied to theoretical subjects.

Eighth, the programs needed in the implementation of problem-based learning. Most teachers stated that the implementation of problem-based learning required socialization, preparation of tools, lesson planning, and learning evaluation.

Ninth, the tools needed in implementing problem-based learning. Most teachers stated that to implement problem-based learning, learning designs, textbooks, modules, teaching materials, media, and evaluation tools were needed.

Tenth, the benefits of problem-based learning were: (a) 2 people or 10% of teachers stated that they had not felt the benefits of problem-based learning; (b) 17 people or 89% of teachers stated that they had benefited from problem-based learning.

Based on the above data, it could be proven that basically schools and teachers had sufficient potential to implement problem-based learning. All teachers showed positive perceptions of problem-based learning and stated that problem-based learning had advantages to improve students' abilities in both hard skills and soft skills aspects.

Learning Conditions in the Application of Problem-based Learning

Based on reflections on the implementation of problem-based learning, there were several results of the implementation of problem-based learning in the application of the 2013 Curriculum.

First, the teachers stated that problem-based learning was learning that was easy to plan. However, in its application it still took quite a long time for teachers to start planning lessons. This mainly concerned teachers' doubts whether problem-based learning could be implemented in harmony with the learning expected in the 2013 Curriculum implementation. It still took time for the teacher team to believe that problem-based learning was in line with the learning expected in the 2013 Curriculum. Problem-based learning emphasized that problem-based learning was learning that was in harmony with a scientific approach which was important to emphasize. This would reduce the teacher's doubts in planning learning with problem-based learning

Second, the teachers argued that problem-based learning would be easier to apply if it was supported by complete materials, media and teaching materials. With complete materials, media, and teaching materials, the teacher would be free to design problems according to student characteristics. Thus, the teacher's ability to develop learning materials, media, and teaching materials was one of the keys to the successful application of problem-based learning.

Third, problem-based learning could be applied to both simple and complex material. For simple material, problem-based learning could be applied more easily, however for complex material, some teachers who tried still experienced difficulties in the early stages. Therefore, teachers needed to applying problem-based learning in simple learning material first, then after having experience, they could apply it in more complex material. Likewise in theoretical learning, most teachers stated that problem-based learning was easier to apply in theoretical learning, although that did not mean it could not be applied in practical learning. For practical learning,

the problem-based learning aspect needed to be emphasized in an effort to build a framework of "how to make practice carried out properly and efficiently." Thus, problem-based learning was not intended to change or question standard practice methods.

Fourth, the teachers stated that problem-based learning was able to support learning in the application of the 2013 Curriculum. The abilities that emerged did not only concern students' mastery of learning material, but other abilities that were affective or soft skills could develop properly. These abilities include the ability to ask questions, express opinions, cooperation, discipline, hard work, activeness, and creativity. Thus, problem-based learning could improve student competence in a comprehensive manner covering aspects of knowledge, attitude, and skills.

Fifth, the most crucial aspect and which was felt to require hard work in a scientific approach and problem-based learning was organizing questions or cultivating students' ability to ask questions. This was felt by most teachers. In other aspects such as collecting data, associating, and communicating students did not experience significant difficulties. Therefore, the ability to ask questions for students was an important aspect that needs to be improved.

CONCLUSION

Problem-based learning had the potential to be applied in the implementation of the 2013 Curriculum in Vocational High Schools. The suitability of the implementation of learning in the implementation of the 2013 Curriculum was included in the category. Most teachers stated that problem-based learning is feasible to be applied in each subject in the implementation of the 2013 Curriculum. The first step that needed to be taken in implementing problem-based learning was to change the mindset of teachers about problem-based learning. Problem-based learning was based on the theoretical framework of constructivism, social learning, situated cognition, and community of practice as learning theories. These theories shared common themes of interrelated learning contexts and processes. It needed to be convinced that problem-based learning was learning that could be applied in supporting learning in the 2013 curriculum and the need for teacher training in implementing problem-based learning, preparing teaching materials, media, and teaching materials and was proven to be able to increase student competence in the aspect of abilities (hard skills) and attitudes (soft skills).

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