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# Problem Based Learning Module Based on Curriculum of Freedom for Seven Grade Students of Junior High School

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**Abstract:** Problem-Based Learning (PBL) is a student-centered instructional approach that promotes critical thinking and problem-solving skills through authentic learning experiences. This study aimed to develop a Problem-Based Learning (PBL)-based English learning module aligned with the Merdeka Curriculum for seventh-grade students. The study employed a Research and Development (R&D) design using the ADDIE model, which consists of Analysis, Design, Development, Implementation, and Evaluation. The participants were 24 seventh-grade students of SMPN 3 Kapur IX. Data were collected through interviews, classroom observations, expert validation sheets, questionnaires, and pre-test and post-test assessments. Three experts validated the developed module before its classroom implementation. The practicality test showed an average score of **94.67%**, indicating that the module was highly practical. The Kolmogorov–Smirnov test produced p-values of **0.200** for the pre-test and **0.050** for the post-test, indicating that both datasets were normally distributed ($p \geq 0.05$). Furthermore, Levene's Test yielded a significance value of **0.069**, confirming the homogeneity of variance. These findings indicate that the developed PBL-based English learning module is valid, practical, and effective for supporting English learning and enhancing students' problem-solving skills in the context of the Merdeka Curriculum.



## INTRODUCTION

Problem-based learning (PBL) is an educational method that encourages learners to explore real-world problems and develop solutions as a means of developing knowledge and skills. PBL is based on the idea that problem solving is a powerful and effective way to learn, and encourages learners to think critically and creatively. Through PBL, learners are presented with a problem and must then collaborate to research and develop a solution. This approach encourages active learning, encourages creativity, and increases student engagement.First, based on the observation on the book that is used during the English class, the book that is used is outdated Second, the students' problem solving skill is low. This was proven by the score of the students' problem solving skill which was categorized as low. The questionnaire is adopted from the Problem-Solving Inventory created by Heppener and Petersen which already used by various research to measure the problem solving skill. From the 10 respondents that were taken randomly from total of 24 students to do the questionnaire about problem solving skill, it was found the average score the

respondents was 54,91% which was categorized as having low problem solving skill. This means the students lack of skill to approach, identify, solve or avoid the problems. Furthermore, this also become more reason for the researcher to make a learning module based on problem solving approach. Third, based on the interview with the teacher, it was found that they are in need of a learning aid such as module. One of the teachers said that she wants to have a proper learning module, but she cannot make it on her own. The researcher assumes that the lack of training and available resource was the reason. She also added that downloading the learning module from the internet is useless since the material sometime not match with what she teaches and it is hard for her to re-compile the learning module from the internet. The researcher also tried to download the learning module related to the 7$^{th}$ grade material that are available from the internet, and the researcher is convinced that the module is not well made and most of them only contain one or two learning material. From the problems above, developing a problem based learning module will be an effective way to solve those problems.

Constructivism focuses on teaching students how to think and understand, and equips them with the skills to solve real-life problems. This approach to learning is centered on the idea that knowledge is meaningful and is applicable to other contexts [1]. Constructivist classrooms provide an environment in which students can explore their natural curiosity and ask questions about their surroundings. Additionally, learning activities in these classrooms are designed to simulate real-world settings and thus, engage students.

Problem based learning (PBL) is a kind of learning where the problem will be the first that is provided and the students whether they are in group or by themselves need to work on that problem such identifying it, solving it, and concluding it. According to Barbara problem-based learning is a type of instruction that has existed since before formal education was introduced; it involves the learner being presented with a problem, query, or puzzle that they are motivated to solve [3]. This means that PBL has been there even before the formal education exists. For example, a cave man would use animal fur to fight against the cold since he was exposed to cold weather for a long time. The cold here represent the problem that the cave man needs to solve. According to Duch et al (2001) [5], the process of problem-based learning are as follow:

1) Students are given a problem (such as a case study, a research paper, or a video) and then they work together in fixed groups to integrate their ideas and prior knowledge regarding the issue and try to recognize the overall scope of the problem.
2) During the discussion, students may bring up "learning issues" which are questions and help to guide the conversation. The students are motivated to state what they know and, more significantly, what they do not know.
3) The students arrange the learning issues from the session in order of importance and figure out which ones will be discussed by the whole group and which ones can be handled by individual students. Additionally, they and the instructor come to a consensus on what resources are necessary for researching the topics and where to find them.

4) When students get back together, they review what they have already learned and incorporate their new understanding into the situation. They should also try to organize their knowledge and associate new ideas with old ones. As they work through the problem, they will likely identify more issues to explore. They will eventually realize that learning is an ongoing activity, and there will always be things to be discovered (even the teacher may find something new).

A module is a self-contained, self-instructional package that enables learners to progress in their studies based on their own abilities and capacities. Modules are individual units of a planned sequence of learning activities that are created to help students reach certain predetermined objectives. It is a unit of educational material that is complete on its own and can have other units added on to achieve bigger tasks or long-term objectives.[2] According to Bloor, there are a few reasons for incorporating module into English instruction. One purpose is to help learners recognize, understand, and appreciate different kinds of English texts. A second purpose is to help non-native English speakers comprehend material in the English language which they may need to read. Lastly, it is to show students how to use strategies when learning English in order to aid in their specialized studies [3] Mishan and Brown both agree that materials are an important part of language learning, but view them in different ways. Mishan believes materials to be a combination of the text and language learning tasks based on it, while Brown sees materials as any systematic description of the techniques and exercises used in classroom teaching[7][4].

According to Ur (2009) [11], there are some criteria that a module should have, they are such as follow: Objectives are explicitly laid out in an introduction, and implemented in the material; Approach is educationally and socially acceptable to target community; Clear attractive layout; print is easy to read; Appropriate visual materials are available; Interesting topics and tasks; Varied topics and tasks, so as to provide for different learner levels, learning styles, interests, etc; Clear instructions; Systematic coverage of syllabus; Content is clearly organized and graded (sequenced by difficulty); Periodic review and test sections; Plenty of authentic language; Good pronunciation explanation and practice; Good vocabulary explanation and practice; Good grammar presentation and practice; Fluency practice in all four skills; Encourages learners to develop own learning strategies and to become independent in their learning; Adequate guidance for the teacher; not too heavy preparation load; Audio cassettes; Readily available locally.

Previous studies consistently demonstrate that Problem-Based Learning modules positively influence students' learning outcomes, learning independence, and problem-solving abilities. In science education, several researchers have successfully developed PBL-based modules for biotechnology (Yani et al., 2017), electrolyte and non-electrolyte solutions (Sari et al., 2019), solubility and solubility product (Sulistiyanti et al., 2021), and hydrocarbon materials (Zhafirah et al., 2020). These studies reported that the developed modules were valid, practical, and effective in improving students' critical thinking and problem-solving skills. Similarly, studies conducted by Handayani (2018) and Permatasari and Anhar (2019)

demonstrated that PBL modules significantly enhanced students' learning independence and academic achievement within thematic learning contexts.

Although previous studies have confirmed the effectiveness of PBL-based modules in various subject areas, most of them focused on science-related disciplines and thematic learning. Research investigating the development of PBL-based modules for English as a Foreign Language (EFL), particularly within the implementation of the Merdeka Curriculum at the junior high school level, remains limited. Therefore, there is still a need to develop instructional materials that integrate PBL principles with English language learning to improve students' problem-solving skills and learning engagement.

Therefore, this study aimed to develop and validate a Problem-Based Learning-based English learning module for seventh-grade students under the Merdeka Curriculum using the ADDIE development model. Unlike previous studies that primarily focused on science education, this research applies the PBL approach to English language learning and evaluates the module's validity, practicality, and effectiveness through expert validation and classroom implementation.

## METHOD

This study employed a Research and Development (R&D) design to develop a Problem-Based Learning (PBL)-based English learning module for seventh-grade students under the Merdeka Curriculum. The study adopted the ADDIE instructional design model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was selected because it provides a systematic framework for developing, validating, implementing, and evaluating instructional products in educational settings.

The participants of this study were 24 seventh-grade students of SMPN 3 Kapur IX, West Sumatra, Indonesia. In addition, three experts participated as validators to assess the content validity of the developed module and research instruments. One English teacher also participated in the practicality evaluation of the module.

## RESULT AND DISCUSSION

### 1. Analysis Stage

The analysis stage was conducted to identify the instructional needs and learning problems faced by both teachers and students. Classroom observations and interviews with the English teacher revealed that students frequently experienced difficulties in understanding English learning materials and lacked adequate problem-solving skills. Furthermore, the teaching materials currently used in the classroom were considered outdated and did not fully support the implementation of the Merdeka Curriculum. Teachers also expressed the need for contextual instructional materials because developing teaching modules independently required considerable time and expertise. These findings indicate that developing a PBL-based English learning module is necessary to facilitate meaningful learning and improve students' engagement.

These findings are consistent with constructivist learning theory, which emphasizes that meaningful learning occurs when students actively construct knowledge through authentic problem-solving activities. Therefore, a Problem-Based Learning module is expected to provide students with opportunities to develop critical thinking, collaboration, and problem-solving skills simultaneously.

**1. Design Stage**

Based on the needs analysis, the researcher designed a learning module consisting of five major components, namely general information, module content, learning activities, appendices, and assessment instruments. The module was developed according to the principles of the Merdeka Curriculum and integrated the five phases of Problem-Based Learning into each learning activity. This design ensured that students actively participated in identifying problems, investigating solutions, presenting findings, and reflecting on their learning experiences.

2. Development Stage

During the development stage, the initial draft of the module and research instruments underwent expert validation involving three experts. Overall, the validation results indicated that all instruments achieved validity scores ranging from 76.67% to 97.92%, which fall into the valid to very valid categories. The Intraclass Correlation Coefficient (ICC) values also demonstrated high inter-rater agreement among the experts, indicating that the evaluation results were consistent and reliable.

High expert agreement indicates that the developed module adequately represents the learning objectives, instructional content, language use, and assessment components required by the Merdeka Curriculum. Similar findings have been reported by Yani et al. (2017) and Zhafirah et al. (2020), who concluded that expert validation is an essential stage for ensuring the quality of instructional modules before classroom implementation.

3. Implementation Stage

After testing the validity and reliability at the previous stage, then the socialization stage was carried out as the last series of activities in the development process. Before the socialization stage was carried out, several product revisions were also carried out and made based on the previous stage. Product revisions were made based on the suggestions given by the validator. Suggestions from validators are considered as important elements in the product development process. Therefore, several important revisions of the product are described at this stage. For suggestions and comments from the validator as a basis for revision are suggestions related to student worksheets. There are several suggestions related to student worksheets so that more practice questions are made with the aim that students can better understand the material from the module. Revisions made based on suggestions and comments from the validators that have been explained are very useful for developing module ideas. Through revision researchers can also improve the quality, accuracy, and accuracy of the module. So that modules based on Problem Based Learning (PBL) problems can be developed by researchers according to the referenced conditions. Requirements that must be considered in making PBL modules are clear Learning Outcomes, project topics or themes, project boundaries and scope, instructions for student steps in carrying out projects,

supporting resources, evaluation and assessment, time in carrying out projects, space for creativity, support and feedback.

Following expert validation and revision, the module was implemented in a seventh-grade classroom involving twenty-four students. The practicality evaluation yielded an average score of 94.67%, indicating that both teachers and students considered the module highly practical and easy to use during classroom instruction.

The high practicality score suggests that the module successfully accommodated students' learning characteristics while reducing teachers' instructional workload. This finding supports previous studies reporting that PBL modules provide flexible and engaging learning experiences.

4. Evaluation Stage

The effectiveness of the developed module was evaluated using normality and homogeneity tests prior to hypothesis testing. The Kolmogorov–Smirnov test indicated p-values of 0.200 for the pre-test and 0.050 for the post-test, suggesting that both datasets met the assumption of normal distribution. Furthermore, Levene's test produced a significance value of 0.069, indicating homogeneous variance between the compared datasets. Therefore, the statistical assumptions required for further parametric analysis were fulfilled.

Meeting the assumptions of normality and homogeneity strengthens the validity of the subsequent statistical analysis. These findings indicate that the observed improvement in students' learning outcomes can reasonably be attributed to the implementation of the developed PBL-based module rather than violations of statistical assumptions.

## Data analysis

Data analysis was conducted after the development and implementation stages to evaluate the quality of the developed module and the research instruments. Two different analyses were performed. First, expert validation involving three validators was conducted to examine the content validity of the module and research instruments. Second, a field trial involving 24 seventh-grade students was carried out to examine item validity, reliability, data normality, and homogeneity using SPSS version 22. The analyses consisted of item validity testing, reliability testing, intraclass correlation coefficient (ICC) analysis, normality testing, and homogeneity testing.

**1.** Item Validity, Reliability, and Intraclass Correlation Analysis

Following expert validation, the revised instruments were administered to 24 seventh-grade students during the field trial. The responses obtained from the students were analyzed using SPSS version 22 to examine the validity and internal consistency of each questionnaire. Item validity was analyzed using Pearson Product-Moment correlation, whereas reliability was assessed using Cronbach's Alpha. In addition, the Intraclass Correlation Coefficient (ICC) was calculated to determine the consistency of the obtained scores.

a) Results of Student Problem Solving Ability Questionnaire

The results of the item validity analysis indicated that all questionnaire items met the required validity criteria and were therefore considered valid for data collection. The

reliability analysis produced a Cronbach's Alpha coefficient of **0.805**, indicating high internal consistency among the questionnaire items. Furthermore, the ICC value of **0.805** demonstrated a high level of agreement among the obtained scores, suggesting that the instrument produced consistent and reliable measurements.

**Table 3.1**

**Results of Questionnaire Validity Student Problem Solving Ability**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 24 | 100.0 |
| | Excludeda | 0 | .0 |
| | Total | 24 | 100.0 |

Table 3.1 above shows that there are 24 items used to measure the validity of the student's problem solving ability questionnaire and all items are categorized as valid. It also shows reliability statistics. Here's the table:

**Table 3.2**

**Results of Reliability Questionnaire Assessment of Students' Problem- Solving Proficiency**

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .805 | 10 |

Table 3.2 above shows the Cronbach's alpha coefficient of 0.805 which indicates that the internal consistency of the questions is very high. There is equivalence and understanding between the validators in terms of scoring. The following table describes the ICC scores.

**Table 3.4**

**Results of Intra-Class Correlation Coefficient of Questionnaire Assessment of Students' Problem Solving Proficiency**

**Intraclass Correlation Coefficient**

| | Intraclass Correlationb | 95% Confidence Intervals | | F Test with True Value 0 | | | |
|---|---|---|---|---|---|---|---|
| | | LowerBound | Upperbound | Value | df1 | df2 | Sig |
| Single Measures | .292a | .165 | .482 | 5.122 | 23 | 207 | .000 |
| Average Measures | .805c | .663 | .903 | 5.122 | 23 | 207 | .000 |

Table 3.4 shows that the intraclass correlation coefficient of the three assessors is 0.805 and is classified as very high. That is, agreement on the level of scoring is high.

The high reliability coefficient indicates that the questionnaire consistently measured students' problem-solving abilities. According to widely accepted reliability criteria, a Cronbach's Alpha coefficient above 0.70 indicates satisfactory internal consistency. Therefore, the instrument was considered appropriate for measuring students' problem-solving skills during the implementation stage.

b) Student Needs Questionnaire

The validity analysis confirmed that all items in the student needs questionnaire met the acceptable validity criteria. Reliability testing yielded a Cronbach's Alpha coefficient of **0.815**, indicating excellent internal consistency. Likewise, the ICC analysis showed an average agreement coefficient of **0.815**, suggesting that the questionnaire consistently measured students' learning needs.

**Table 3.5**
**Results of the Validity Questionnaire of Students' Needs in Learning English**
**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 24 | 100.0 |
| | Excludeda | 0 | .0 |
| | Total | 24 | 100.0 |

Table 3.5 above shows that there are 24 items used to measure the validity of the student's problem solving ability questionnaire and all items are categorized as valid. It also shows reliability. It is shown in the following table:

**Table 3.6**
**Questionnaire Reliability Results of Student Needs in Learning English**
**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .815 | 51 |

Table 3.6 above shows the Cronbach's alpha coefficient of 0.815 which indicates that the internal consistency of the questions is very high. There is equivalence and understanding between the validators in terms of scoring. The following table describes the ICC scores.

**Table 3.7**
**Results of Intra-Class Correlation Coefficient of Student Needs Questionnaire in Learning English**
**Intraclass Correlation Coefficient**

| | Intraclass Correlation | 95% Confidence Intervals | | F Test with True Value 0 | | | |
|---|---|---|---|---|---|---|---|
| | | LowerBound | Upperbound | Value | df1 | df2 | Sig |
| Single Measures | .080a | 042 | .160 | 5,406 | 23 | 1150 | .000 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Average Measures | .815c | .692 | .906 | 5,406 | 23 | 1150 | .000 |

Table 3.7 shows that the intraclass correlation coefficient of the three assessors is 0.815 and is classified as very high. That is, agreement on the level of scoring is high.

These findings indicate that the questionnaire adequately represented students' perceptions regarding English learning needs and could therefore be used as a reliable instrument for needs analysis during module development.

c) Student Response Questionnaire

The student response questionnaire also demonstrated satisfactory psychometric properties. All questionnaire items fulfilled the validity requirements, while the reliability analysis yielded a Cronbach's Alpha coefficient of **0.692**. Although this value is lower than those of the previous instruments, it still indicates acceptable internal consistency for educational research. The ICC analysis also confirmed satisfactory agreement among the obtained scores.

The student responses indicate that the developed module was generally well accepted by learners and successfully supported classroom learning activities.

**Table 3.8**
**Results of Questionnaire Validity of Student Responses to Curriculum-Based PBL Modules**
**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 24 | 100.0 |
| | Excluded | 0 | .0 |
| | Total | 24 | 100.0 |

Table 3.8 above shows that there are 24 items used to measure the validity of the student's problem solving ability questionnaire and all items are categorized as valid. It also shows reliability. It is shown in the following table:

**Table 3.9**
**Reliability Questionnaire Results of Student Responses to Curriculum-Based PBL Modules**
**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .692 | 20 |

Table 3.9 above shows the Cronbach's alpha coefficient of 0.692 which indicates that the internal consistency of the questions is very high. There is equivalence and understanding between the validators in terms of scoring. The following table describes the ICC scores.

**Table 3.10**
**Results of Intra-Class Correlation Coefficients Questionnaire Student Responses to Curriculum-Based PBL Modules**
**Intraclass Correlation Coefficient**

| | Intraclass Correlation | 95% Confidence Intervals | | F Test with True Value 0 | | | |
|---|---|---|---|---|---|---|---|
| | | LowerBound | Upperbound | Value | df1 | df2 | Sig |
| Single Measures | .101a | 044 | .214 | 3,245 | 23 | 437 | .000 |
| Average Measures | .692c | .480 | .845 | 3,245 | 23 | 437 | .000 |

Table 3.10 shows that the intraclass correlation coefficient of the three assessors is 0.692 and is classified as very high. That is, agreement on the level of scoring is high.

d) Teacher Response Questionnaire

The teacher response questionnaire obtained a validity score of **94%**, indicating that the developed module was highly appropriate for classroom implementation. The teacher considered the module to be practical, relevant to the Merdeka Curriculum, and easy to integrate into English learning activities.

Positive teacher responses demonstrate that the developed module not only met curriculum requirements but also supported teachers in organizing more student-centered learning activities.

**Table 3.11**
**Results of Teacher Response Questionnaire Validity on Curriculum-Based PBL Modules**

| **Number of Questions** | **Total** | **Max Score** | **%** | **Category** |
|---|---|---|---|---|
| 20 | 94 | 100 | 94 | Valid and Reliable |

**Table 3.11** presents the results of the teacher response questionnaire toward the developed PBL-based module. The questionnaire obtained a validity score of **94%**, indicating that it falls within the **very valid** category. This finding suggests that the questionnaire is appropriate for evaluating teachers' perceptions of the developed module. Therefore, the teacher response questionnaire was considered suitable for use in assessing the practicality of the PBL-based module during the implementation stage.

a) Results of Teacher and Class Observation Questionnaire

The teacher and classroom observation questionnaire was evaluated by **three expert validators** to determine its content validity. The validation results indicated that the instrument met the established validity criteria and was considered appropriate for evaluating classroom implementation of the developed PBL-based module. The detailed validation results are presented in **Table 3.12**.**Table 3.12**

**Results of Teacher and Class Observation Questionnaire Validity**

| **Number of** | **Total** | **Max** | **%** | **Category** |
|---|---|---|---|---|

| Questions | | Score | | |
|---|---|---|---|---|
| 17 | 12 | 17 | 75 | Valid and Reliable |

Based on Table 3.12, the results of the analysis indicate that the observation sheet questionnaire has a high level of validity. The results of the assessment showed satisfactory results, with a percentage value of 75%. In this way, the use of teacher and class observation sheet questionnaires can be considered valid and reliable in the context of this study, thus giving confidence in the results obtained from the assessment.

2. **Normality test**

The normality test aims to determine whether the data is normally distributed or not. In this normality test, the hypothesis is that the data is normally distributed (Ha) and not normally distributed (Ho). The results are shown in the following table to provide a clearer picture:

**Table 3.13**
**Normality Test Results**

**Tests of Normality**

| | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistics | df | Sig. | Statistics | df | Sig. |
| Pre_Test | .145 | 24 | .200* | .855 | 24 | 003 |
| Post_Test | .177 | 24 | .050 | .917 | 24 | .049 |

Based on Table 3.13, there are Kolmogorov-Smirnov values for the Pre-Test and Post-Test categories respectively showing values of 0.145 and 0.177, with significant alpha values of 0.200 and 0.050. All the Kolmogorov-Smirnov alpha significance values exceed the alpha value of 0.05. This indicates that the data from both classes have a normal distribution, so the Ha can be accepted and the Ho is rejected.

3. **Homogeneity Test**

The homogeneity test aims to determine whether the variance in a certain population is homogeneous or not, as well as one of the conditions before conducting an independent sample t-test. In this test, the hypothesis used is as follows: Ho states that the variance is homogeneous, while Ha states that the variance is not homogeneous. The homogeneity test results can be seen in the table:

**Table 3.14**
**Homogeneity Test Results**
**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | Df | Sig. (2-tailed) | Mean Differences | std. Error Difference | Lower | Upper |
| Mark | Equal variances assumed | 3,456 | .069 | -7,803 | 46 | .000 | -23.54167 | 3.01685 | -29.61427 | -17.46907 |
| | Equal variances not assumed | | | -7,803 | 35,549 | .000 | -23.54167 | 3.01685 | -29.66281 | -17.42052 |

Based on Table 3.14. above, a Levene score of 3,456 is obtained with a significant value of 0,069. This score exceeds the alpha value of 0.05. If the homogeneity score exceeds the alpha value of 0.05, it can be concluded that the data is homogeneous.

## CONCLUSION

1. From this analysis, it shows that both teachers and students face difficulties in the learning process, which has an impact on students' understanding of learning material. The results of the defining stage show the need to develop a learning model that can increase students' understanding of the material and prevent boredom during learning.
2. Researchers design learning modules that can increase students' interest in learning. Learning is carried out in several stages, namely introduction, organizing students, guiding investigations, developing and presenting material, analysis and evaluation, and finally closing after learning is complete.
3. The researcher concluded that the learning module was included in the category of valid, practical and interesting.

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