

# The Effect of E-Problem Based Learning on Students' Interest, Motivation and Achievement

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**The Effect of E-Problem Based Learning on Students' Interest, Motivation and Achievement**

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The Covid-19 pandemic has led to the birth of many online learning platforms to support teaching and learning processes. The limitation of face-to-face meetings imposed by the Covid-19 pandemic has encouraged various parties to develop learning models with effective and efficient technology applications such as Zoom and Google Meet. Such applications can be integrated with the existing learning models, including the Electronic-Based Problem-Based Learning (E-PBL) Model, to improve student achievement. The study revealed whether the E-PBL Model, motivation, and learning interest affected student achievement in the entrepreneurship subject. This study was quantitative, employing E-PBL software. The population was 206 students and 129 students as the samples. Data were collected using observation, interviews, and questionnaires and analyzed using Path Analysis. The E-PBL Model significantly affected motivation, learning interest, and achievement with a p-value of 0.000 (highly significant) and R-square of 0.627. It means that the E-PBL Model, motivation, and learning interest affected 62.7% of learning achievement. It is recommended that teachers implement the E-PBL Model because it can increase learning motivation and interest that finally increase learning achievement during the Covid-19 pandemic.

Keywords: E-PBL, motivation, interest, learning achievement, entrepreneurship subject

**INTRODUCTION**

The local governments of Indonesia have decided not to let schools conduct face-to-face meetings due to the Covid-19 pandemic since the middle of March 2020. Schools and campuses around Indonesia are encouraged to have online meetings. In the meantime, the e-University represents the development of the higher education learning model to support learning and better information provision through the internet. The internet also supports the teaching and learning process at universities.

Online classes have been a solution during the Covid-19 pandemic (Purwanti & Krisnadi, 2020; Rachmat & Kisanadi, 2020). Online classes can be facilitated by various existing online platforms (Suhada et al., 2020) such as Zoom, Google Classroom, e-mail, and so forth. A fun and exciting learning model can help to reduce boredom in learning. Students following online learning also need various learning models to avoid boredom (Widiyono, 2020). In addition to using an interesting learning model, a teacher's creativity is also crucial to build fun learning activities for students (Hikmat et al., 2020).

One of the learning models that can help reduce students' boredom in online learning is the Electronic-Based Problem-Based Learning (E-PBL) Model. E-PBL provides students with learning tasks to learn through experiences and real-world conditions based on problems given (Yamin, 2013).

Student-centered learning methods are becoming increasingly popular in education (Baeten et al., 2010). The methods were developed as a reaction to teacher-centered learning, which focused on transmitting knowledge and meaning from teachers to students. On the other hand, in student-centered learning, students have an active role and take advantage of classroom practices such as observation, generating questions, discussing, and self-studying. The active learning models are believed to promote a deeper understanding of materials and facilitate transferring knowledge to other domains or working (Baeten et al., 2010). Problem-based learning (PBL) is an example of a student-centered learning environment. Students in small groups typically work on problems that have been formulated in order to obtain information and select the best self-skills for investigating problems and offering the best solutions (Palupi, Subiyantoro, Rukayah, & Triyanto, 2020).

Baturay & Bay (2010) state that web-based education as an alternative to face-to-face learning is now being expanded to apply for higher education. Many efforts are made to provide rich and engaging multimedia content to learners. The use of multimedia technology has a significant effect on student learning, and so does the chosen teaching methodology. Supported by a Constructivist approach, Problem-Based Learning is one method that can be applied in a web-based learning environment. This study investigates the effects of problem-based learning on student classroom community perceptions and achievement.

The E-PBL Model effectively develops questioning skills, thinking skills, problem-solving skills, and independent learning. Ibrahim (2005) and Amaral, & Fregni, (2021) suggests that Problem-Based Learning encourages dynamic behavior, motivation, creativity, initiative, and thinking skills in students. Fadly (2012) confirms an increase in learning activities and achievement of learning outcomes after applying the Electronic-Based Problem-Based Learning model on the entrepreneurship subject.

The entrepreneurship subject aims to develop the entrepreneurial spirit in students to become dynamic, motivated, and creative individuals with good thinking skills. They can work together in doing tasks. Unfortunately, many entrepreneurship lecturers only use conventional learning methods dominated by lecturing, questioning, and tasks. The weaknesses of conventional learning models are the lack of student interaction and understanding of the information delivered by the lecturers.

Conventional learning models emphasize observable behavioral changes, but the independent university curriculum demands observable behavioral changes and changes in students' critical thinking skills. Therefore, lecturers need a learning model that does not burden students with learning facts to improve learning outcomes. The entrepreneurship subject with the E-PBL Model gives an option for a better learning model.

The E-PBL Model is a student-centered learning model that uses problems to collect and integrate new knowledge. Students are given questions at the beginning of the learning process. They then solve problems and finally integrate knowledge in the form of reports. Problem-Based Learning on the entrepreneurship subject can provide a deeper understanding of theoretical and practical analysis.

Munawaroh (2020) and Amaral, & Fregni, ( 2021) found that combining the Problem Based Learning model with e-learning applications (E-PBL) can help students solve and explore critical thinking skills, as well as pique their interest in addressing learning challenges.

This research is supported by Cao & Meng (2020) on the role of motivation in learning, showing a strong relationship between previous performance, motivation, and future achievement. Motivation is significantly related to achievement and all global competence dimensions of primary school learning English in China (Hu and McGeown, 2020) and foreign language achievement.

How students perceive learning depends directly on their interests, pedagogical influence, and their learning performance and indirectly on student-instructor interactions, instructor responsiveness, course organization, instructor preference or attention, and student achievement (Abrantes, Seabra, & Lages, 2007).

However, Setyawati et al. (2017) found that motivation influenced only 41% of the learning outcomes of economics courses using a Problem-Based Learning model with the help of mobile learning. The explanation above has motivated us to examine the effect of the E-PBL Model using the online platform (website) developed by STKIP PGRI Jombang and CV Ainfo Informatika. The E-PBL software aims to help manage information on learning activities that involve interaction between lecturers and students in achieving learning objectives in the entrepreneurship course for students of the Economic Education Study Program at STKIP Jombang Indonesia.

## THEORETICAL REVIEW

Problem-Based Learning is a learning model in which students face authentic and engaging problems to construct their knowledge, develop problem-solving skills, and find solutions to the problems given (Arend, 2012). Amir (2009) affirms that Problem-Based Learning is one of the learning models where students face real-world problems to start learning and innovative learning that can provide active learning conditions. Problem-Based Learning is a curriculum development where problems are designed that require students to acquire knowledge, be proficient in solving problems, have their learning strategies and skills to participate in teams, and use a systemic approach in the learning process to solve problems or challenges. PBL employs a constructivist approach in which students attempt to solve real-world problems in a collaborative setting (Mustofa & Hidayah, 2020)

The application of electronic learning (e-learning) can be made through a media site (website e) that can be accessed via the internet or web-based learning. One of Kruse's writings, "Using the Web for Learning", published on [www.elearning.com](http://www.elearning.com), states that web-based learning has many benefits for students (Rusman, 2013). The use of e-learning for students aged 14-16 at the secondary education level can improve the involvement of students with low abilities, provide opportunities for accelerated learning for intelligent and talented students, and develop students' independent learning abilities through individual learning experiences (Boulton, 2008).

All areas of economic education recognize the motivational component of learning. The most widely used motivation theory is the Self-Determination Theory (SDT), as described by Ryan & Deci (2000). The theory postulates that every human being has an innate desire to grow, which manifests when the three basic psychological needs (competence, autonomy, and relatedness) are met. Various kinds of motivation underlie human behavior, depending on satisfying basic psychological requirements (Ryan & Deci, 2000). Intrinsic motivation is often defined as the desire or personal interest of an individual in completing a task. As a result, people engage in activities for their own sake rather than for the sake of extrinsic rewards. On the other hand, extrinsic motivation stems from the expectation of external incentives such as praise, rewards, rewards, and evaluations.

Motivational factors such as teaching strategies and learning motivation also affect student achievement. The positive interaction of learning experiences strengthens motivation and inspires participants to react to their surrounding challenges (Wen & Piao, 2020). In addition, using Computer-Assisted Language Learning (CALL) can contribute significantly to learning English; however, success largely depends on the type of motivation each student provides, on the quality of tutoring assistance, and on how effective and entertaining the teaching strategy is (Escobar Fandiño et al., 2019).

Interest is a feeling of preferring a particular thing or activity without anyone telling (Asmani, 2009). A person starts with paying attention to something he/she is interested in. Interest is closely related to personality, where the cognitions, emotions, and connotations sometimes arise by themselves and sometimes need to be cultivated. The tendency of the soul towards something, consisting of feelings of pleasure, attention, sincerity, and the existence of motives and goals in achieving a goal, is called interest. Hidi (2001) states that interest and its role in learning have been conceptualized, and the focus is a specific relationship between interest and reading. Issues considered are the influence of interest on reader understanding and learning, the variables that determine reader interest, and specific processes such as attention that can mediate learning interest.

According to Djamaroh, learning outcomes that are realized in shapes, numbers, letters, and sentences that reflect the results achieved by each student are named as achievements (Syafi'i et al., 2018). Learning achievement is evidence of student achievement after participating in learning activities within a certain time in the form of changes in behavior, skills, and knowledge. Mental and attitudes that are always actively trying to improve work results in increasing income define entrepreneurship (Daryanto, 2013). The same thing is stated by Basrowi (2014), entrepreneurship is a human process related to creativity and innovation in understanding opportunities, organizing resources, and managing them so that these opportunities are realized into a profitable business.

All information encountered and known by humans through the five senses and their minds on efforts to build values through their ability, courage, determination, and creativity in taking risks in obtaining opportunities for success and knowing the factors that influence success is entrepreneurial knowledge. Hasril Amiruddin (2015), in his research entitled "An Investigation Effects of Mastery Learning Strategy on Entrepreneurship Knowledge Acquisition among Aboriginal Students", states that entrepreneurial achievement is obtained from effective entrepreneurial knowledge learning strategies. Antonio et al. (2014) state that entrepreneurial achievement comes from three main characteristics: creativity, intelligence, and personality.

#### **Research questions**

1. How is the effect of E-PBL toward students' motivation?
2. How is the effect of E-PBL toward students' achievement?
3. How is the effect of E-PBL toward students' motivation?
4. How is the effect of motivation toward students' achievement?
5. How is the students' learning interest toward students' achievement?
6. How is the effect of motivation toward students' learning interest?

#### **METHOD**

**Research design**

This study used a quantitative method to conduct an analysis. According to Creswell (2013), quantitative research is a type of research that explains a problem by collecting numerical data and analyzing it using statistics. The objective of this study is to analyze the influence of the ELP on learning interests, motivation and student entrepreneurial learning achievements during the Covid 19 pandemic, using a quantitative approach model. The close ended questionnaires and a test are a valid ways of collecting data in quantitative studies (Ary et al., 2010). The questionnaires and the test were sent to participants one week before the final class.

**Participants**

This study included 236 students population from the STKIP PGRI Jombang Economic Education Study Program. The sample consisted of 129 students from the 2017-2018 and 2019 academic years. That sample was chosen using a random sampling technique. It was done in order to provide students with equal chances and opportunities for research (Taherdoost, 2016).

**Research Instruments**

The instruments used were students' motivation questionnaire, students' learning interest questioners, E-PBL questioner and a problem-based test with the google form application. The students' motivation questionnaire aimed to obtain data on determining the kinds of the students motivation. The students were given questionnaires via Google Form. The questionnaire was adapted from the article "Factors Affecting Motivation in Language Learning" by Hamidah Abdul Rahman et al. (2017) and modified to fit the participants' level. For ease of calculation, the questionnaire was designed in the Likert Scale format. While students' learning interests were used to collect data on students' learning interests related to E-PBL during the learning entrepreneur course. The questionnaire was adapted from Slameto. (2010) and includes four indicators: happiness, engagement, interests, and attention. The questionnaire, which included 15 items, was completed on a Likert scale with five options: strongly agree, agree, agree, normal, disagree, strongly disagree. The E-PBL use questionnaire was then developed in order to collect data on the use of E-PBL during the learning process.

The E-PBL use questionnaire was then developed in order to collect data on the use of E-PBL during the learning process. The questionnaire, which contained a total of 20 items, was completed using a Likert scale with five choices: strongly agree, agree, agree, normal, disagree, strongly disagree. In the Entrepreneur course, there is a problem-based test with 25 items and multiple-choice answers.

**Data Analysis**

The E-PBL model was used in the study, as were independent variable such as motivation, learning interests, and achievement. Based on the literature review and previous empirical studies, the following equation can be used to represent the relationship between variables:

$$LM = \beta_1 PBL + \varepsilon_1 \dots\dots\dots(1)$$

$$LI = \beta_1 PBL + \beta_2 LM + \varepsilon_2 \dots\dots\dots(2)$$

$$LA = \beta_1 PBL + \beta_2 LM + \beta_3 LI + \varepsilon_3 \dots\dots\dots (3)$$

Explanation :

PBL = Problem Based Learning

LM = Learning Motivation

LI = Learning Interest

LA = Learning Achievement

While the data analysis using Path Analysis test. The Path Analysis model in this study is as follows :

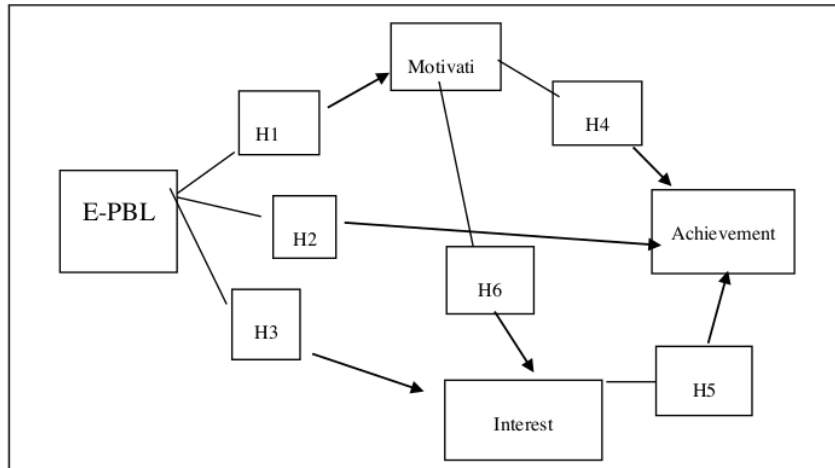


Figure 1  
Path Analysis Mode

## FINDINGS



The following is the construction of causal relationships between variables based on the results of Path Analysis.

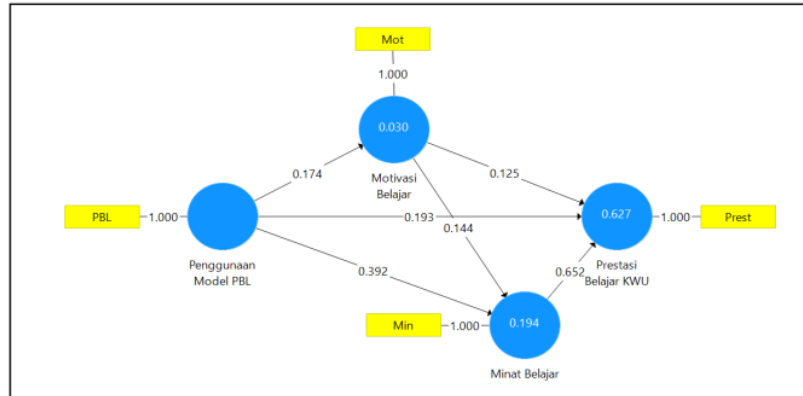


Figure 2.  
Statistical Decomposition Model

The R-Square for each latent dependent variable is presented in Table 1

Table 1  
R-Square

	R-Square	R-Square Adjusted
<b>Interest</b>	0.194	0.181
<b>Motivation</b>	0.030	0.023
<b>Achievement</b>	0.627	0.618

The R-Square value of the learning interest variable is 0.194, meaning that 19.4% of the learning interest variable is influenced by learning motivation. The value of R-Square of the learning motivation variable is 0.030, meaning that the use of E-PBL influences 3% of learning motivation. The R-Square value of the learning achievement variable is

0.627, meaning that 62.7% of learning achievement is influenced by the interest in learning and the use of the EPBL model.

Information about the significance level of the estimated parameters is needed to see the relationship between the research variables. The basis for hypothesis testing is the value in the output for inner weight. Table 2 provides the estimated output for testing the structural model.

Table 2

Path Coefficients , Mean, STDEV, 'T

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Interest → Achievement	0.652	0.707	0.154	4.238	0.000
Motivation → Interest	0.144	0.155	0.069	2.081	0.038
Motivation→ Achievement	0.125	0.109	0.062	2.025	0.043
E-PBL → Interest	0.392	0.396	0.055	7.120	0.000
E-PBL→ Motivation	0.174	0.168	0.082	2.123	0.034
E-PBL → Achievement	0.193	0.166	0.085	2.276	0.023

Table 2 confirms the following results. *First*, learning interest positively and significantly influences achievement, as evidenced by a p-value of  $0.000 < 0.05$  with a coefficient value of 0.652. *Second*, learning motivation positively and significantly influences interest, as evidenced by a p-value of  $0.038 < 0.05$  with a coefficient value of 0.144. *Third*, learning motivation positively and significantly influences achievement, as evidenced by a p-value of  $0.043 < 0.05$  with a coefficient of 0.125. *Fourth*, the E-PBL model positively and significantly influences interest, as evidenced by a p-value of  $0.000 < 0.05$  with a coefficient value of 0.392. *Fifth*, the EPBL model positively and significantly influences learning motivation, as evidenced by a p-value of  $0.034 < 0.05$  with a coefficient value of 0.174. *Sixth*, the EPBL model positively and significantly influences learning achievement, as evidenced by a p-value of  $0.023 < 0.05$  with a coefficient value of 0.193.

The indirect effect between variables is presented in Table 3.

Table 3  
Specific Indirect Effects  
STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics  O/STDEV	P Values
E-PBL → Motivation → Interest	0.025	0.026	0.019	1.324	0.186
Motivation → Interest → Achievement	0.094	0.112	0.064	1.469	0.143
E-PBL → Motivation → Interest → Achievement	0.016	0.019	0.016	1.025	0.306
E-PBL → Interest → Achievement	0.256	0.278	0.066	3.863	0.000
E-PBL → Motivation → Achievement	0.022	0.020	0.016	1.322	0.187

Table 3 shows the indirect effect of E-PBL on achievement mediated by learning interest as evidenced by a p-value of 0.000 <0.05 with a coefficient value of 0.256, while the others are not significant.

## DISCUSSION

The Path Analysis showed the statistical results on each variable and the causal effect between the endogenous and exogenous variables. The findings are elaborated as follows.

### Interest Influenced Achievement

The path analysis confirmed that interest positively and significantly affected achievement. The finding supported the theory of Winkel (2004:188) that interest was a persistent tendency of subjects to be curious in a particular field of study or subject and feel happy to study the material. If students have a high interest in entrepreneurship courses, the hope for success will be greater. Interest is one of the critical factors that affect student achievement. Students who have a high interest in learning have the opportunity to achieve better learning achievement. Antonio, Lanawati, & Christina (2014) revealed that entrepreneurial achievement came from three main characteristics: creativity, intelligence, and personality.

### **Motivation Influenced Interest**

The finding confirmed that learning motivation affected interest. In addition to interest, success in learning is also influenced by learning motivation. Motivation plays an essential role in the success of student learning. Motivation arises from within the student consciously or unconsciously or from outside to achieve the desired goal. In essence, motivation is a psychological condition that encourages someone to do something. In learning activities, motivation can be said as the overall driving force in students that creates, ensures continuity, and provides direction for learning activities to achieve goals. Students who have a high interest in learning will study hard because they are motivated to achieve well. Based on the results from the analysis and supported by the theory, it can be concluded that learning motivation directly affected learning interest.

### **Motivation Influenced Achievement**

The path analysis confirmed that motivation positively and significantly affected achievement. Learning motivation is an impulse that exists in students to carry out learning activities, especially in the entrepreneurship course. High learning motivation existing within the students of Economics Education STKIP PGRI Jombang will help them learn entrepreneurship to achieve maximum learning outcomes.

Student learning motivation is related to students' interest and attention to the entrepreneurship course, enthusiasm in doing entrepreneurial tasks through the E-PBL model, responsibility in doing entrepreneurial tasks, reactions to the stimulus given by lecturers, and enjoyment in doing assignments. Based on the description, it can be seen that learning motivation is essential in learning activities in the classroom because motivation is closely related to achievement. Wen & Piao (2020) supported the finding that motivational factors such as teaching strategies and learning motivation also affect students to achieve well. Positive learning experiences strengthen motivation and inspire participants to react to environmental challenges

### **E-PBL Influenced Interest**

This study proved the influence of E-PBL on learning interests in the entrepreneurship course. Students responded positively to the use of E-PBL learning (Electronic-Problem-based Learning) during the Covid-19 pandemic. Most of them chose "agree" in the questionnaire. Their perception of the online gamification feature indicated that the content was delivered effectively and usefully while also being very easy to use.

The E-PBL model in this study gave better results than conventional learning models. In addition, E-PBL involved students directly in understanding entrepreneurship materials by directly engaging in problem-solving with directed steps. E-PBL made students more independent. E-PBL built cooperation between heterogeneous group members. In addition, E-PBL also helped students be more active in carrying out problem-solving activities because students could directly observe and do the learning

independently using the E-PBL application. It increased students' interest and attention to learning. This finding is supported by Simanjutak et al. (2021). They confirm that that problem-based learning combined with computer assistance is far more effective than problem-based learning or just a traditional teaching method.

#### **E-PBL Influenced Motivation**

The results showed that E-PBL affected motivation. Problem-Based Learning models combined with online learning showed more advantages. This finding is consistent with the results of previous research of Ashtian Mohammad Jafarabadi Mansoor Nomanof Bahram Sadeghi Bigham (2012), showing that the Problem-Based Learning model combined with the application of e-learning was able to assist students in solving problems, developing critical thinking skills, and creating student interest in solving problems. The finding confirmed that students with high and low learning motivation could both benefit E-PBL. The result is in line with Keziah (2010) that Problem-Based Learning models could motivate students to continue to build their knowledge actively so that students who initially had low learning motivation become more challenged in dealing with learning problems.

#### **E-PBL Influenced Achievement**

The result confirmed the effect of E-PBL on learning achievement. Problem-Based Learning models combined with e-learning applications (E-PBL) have better advantages for learning outcomes. The finding is consistent with the results of a previous study by Ashtian et al. (2012), showing that E-PBL helps students solve problems, develop critical thinking skills, and grow interests in solving learning problems. This finding is consistent with the results of previous studies. Simamora (2012) also showed that PBL models resulted in better learning achievement. Thus, E-PBL could improve achievement in the entrepreneurship subject for students with high learning motivation and low learning motivation.

### **CONCLUSIONS**

Based on the findings and discussion, this study suggested that integrating E-problem-based learning (E-PBL) in entrepreneurship courses incorporating such as, has a positive impact on students' learning styles, learning interests, and achievement. 1) There is a significant relationship between entrepreneurial learning achievement and interests, 2) there is a significant relationship between entrepreneurial learning achievement and motivation, 3) there is a significant relationship between motivation and learning interests, and 4) there is a significant relationship between E-PBL and entrepreneurial learning achievement. 5) EPBL and learning interests have a substantial relationship. No correlation exists between E-PBL and learning style. 6) The use of the E-PBL Model has an indirect effect on entrepreneurial learning accomplishment, which is mediated by the variable learning interests. As a result, this study suggests that E-PBL was helpful in addressing students' learning styles, interests, and achievement

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among high school students during both the Covid 19 epidemic and the new normal era. During the learning process, it is also advised that e-learning media be used in conjunction with other learning methods.

E-PBL significantly affects learning motivation, interest, and achievement in the entrepreneurship course with a p-value of 0.000 (highly significant) and R-Square of 0.627. The R-Square means that the effect of E-PBL, learning motivation, and interest on learning achievement is 62.7%. Based on the findings and discussion, the following suggestions are given. *First*, students have to improve their motivation and interest in learning. *Second*, lecturers are suggested upon applying E-PBL during the Covid-19 pandemic to improve student's ability in solving problems in the entrepreneurship course. Third, further studies are suggested to examine the use of e-learning media combined with other learning models. Elearning media combined with PBL can also be implemented in other courses or subjects.

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