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THE EFFECTIVENESS OF THE PROBLEM-BASED LEARNING MODEL ASSISTED BY VIDEO MEDIA ON SCARCITY MATERIAL TO IMPROVE LEARNING OUTCOMES

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Abstract

_ This study investigates the core competencies of agricultural undergraduates in China, aiming to improve their skills through industry-education integration. Using human capital theory, it analyzes the current status via literature review, surveys, and interviews, focusing on L University. Findings show students recognize their field's importance but lack career confidence and practical experience; only 25.5% have internships, and few facultu have industry experience. Gaps in social skills and psychological resilience are noted. To enhance competencies, strategies include creating a pro-agriculture atmosphere, deepening industry-education ties, boosting comprehensive training, and innovating evaluation. The study builds a competency model, highlighting fixed and growth competencies, enriching agricultural education theory. It stresses industry-education integration to meet talent demands for agricultural modernization and points to the need for more research on integration evaluation and context-specific characteristics.

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INTRODUCTION

The success of the learning process can be shown from how much learning outcomes by students. Pramudita and Widiyanti (2022) state that student learning outcomes are very important for learning activities because they can help in making decisions about how to plan and implement future learning. Education plays a very important role in the development and progress of a nation, therefore education must receive serious attention and handling to achieve the quality of education in accordance with the development of science and technology (Gunarta, 2018).

Junipah, Kardoyo, & Yulianto (2019) stated that learning is the process of acquiring knowledge, skills, attitudes, and positive values through the use of various learning resources and media. A person's success in following the learning process at a certain level of education can be seen from the learning outcomes themselves. This is by research conducted by Chotimah and Oktarina (2019) which states that good school quality can be seen from student learning outcomes to determine indicators for assessing school quality and student capacity.

Meke and Wondo (2020) which states that success in the learning process cannot be separated from the teacher's ability to develop learning models that are oriented towards increasing the intensity of student involvement effectively in the learning process. Sirait, Kardoyo, & Setyadharma (2022) stated that the role of the teacher in the learning process is to create a learning environment that encourages students to be involved in the lesson, the teacher's goal is to ensure that students understand the material thoroughly and have a relationship between the material taught and what they learn.

Economics is one of the fields of science related to everyday life, with subject matter that always follows existing economic developments. Based on the results of observations, the learning outcomes of students in class X SMA N 16 Semarang in economics are low with daily test scores below the predetermined KKM of 75, besides that it is caused because there are several sub-chapters that students have not been able to understand because they feel difficult such as scarcity material. In this chapter, students must be able to understand the theory of choice, opportunity costs, and the need for decision-making in limited conditions. As an introductory concept, the material on scarcity requires an adjustment of mindset from everyday thinking to economic thinking. The following are the results of the daily test assessment of class X students of SMA N 16 Semarang in the subject of Economics for class X which are explained in Table 1 below.

Table 1. Results of the Daily Economics Exam for Class X of SMA Negeri 16 Semarang

No	Class	Average Value
1.	XI	46.67
2.	X-2	46.80
3.	X-3	48.37
4.	X-4	47.91
5.	X-5	49.02
6.	X-6	50.13

Source: data processed by the author (2024)

From the data, information was obtained that the average daily test score of students had not reached the specified KKM of 75 in the Economics Subject. This shows that in the implementation of Economics learning at SMA Negeri 16 Semarang, optimal learning outcomes have not been achieved, and teachers have not been able to use varied learning models and media so the role of teachers is more dominant compared to student involvement in learning.

Astutik (2017) in her research stated that PBL is more effective in increasing students' interest in learning when compared to conventional learning. This is supported by research conducted by Hanifah and Indarini (2021) which states that the problem-based learning model is higher than the learning model using the discovery learning model to improve student problem solving. statement of Mujumdar et al., (2024) which states that problem-based learning is considered active, collaborative, and cooperative learning that focuses on students in a real-life context. Economics is a subject that studies the problems of everyday life related to the choice of fulfilling needs and desires.

Minarni (2023) stated that the *problem-based learning* model is effective in increasing students' interest in learning. Kanyesigye, Uwamahoro, & Kemeza (2022) stated that *problem-based learning* is not only effective in improving student learning outcomes but can also increase students' interest in learning. Economics is very suitable for inviting students to think critically and conduct analysis related to events, data, or facts that exist in everyday life. This is by research conducted by Banyal (2021) which states that the learning model using *problem-based learning* can maximize learning outcomes in economics subjects. The results of the same study by Sriamah, Wiryokusumo, & Leksono (2020) in their research stated that there were differences between groups of students whose learning used *problem-based learning* and *direct learning* models in learning achievement, and there was an interaction between the use of the *problem-based learning* model in economics subjects and student learning motivation towards learning achievement.

In addition to using learning models according to needs, learning must also be supported by the selection of creative and innovative media. The media used in student learning activities is audio-visual media. Putu and Suniasih (2022) stated that audio-visual media can increase students' motivation and interest in learning. The use of audio-visual media in the form of videos can help students understand material concepts easily because

they contain elements of sound and movement. The use of problem-based learning models can be done using video media. Noetel *et al*., (2021) stated that specifically, videos allow students to manage their cognitive load by pausing to take notes and replaying difficult parts, or speeding up easy parts. Agung and Koeswanti (2021) stated that using video media can help students understand the subject matter well because the use of video media makes learning conducive, comfortable, interesting, and enjoyable and runs effectively and efficiently.

Digital book media for learning is an educational resource presented in electronic format, allowing students and teachers to access learning materials through digital devices. This digital book provides flexibility in the teaching and learning process because it can be accessed anytime and anywhere. In the context of learning, digital book media acts as an effective means of delivering educational materials more interestingly and interactively, supports various learning styles, and facilitates regular content updates, so that students will be motivated to learn. Nahriyah and Rachmadiarti (2023) stated that e-books *are problem-based learning* that can train students' critical thinking skills. In addition, digital book media can improve student learning outcomes by providing easier and faster access to various interactive and interesting learning materials. This is by research conducted by Yunarzat et al. (2024) which states that student learning outcomes can be improved by using digital books.

Problem-based learning model, this learning model is suitable for application in economics learning in high schools. Economics subjects are very suitable for inviting students to think critically and conduct analyses related to events, data, or facts that exist in everyday life. With the approach of the problem-based learning model assisted by video media, student learning outcomes can be improved because students actively participate in solving existing problems and conducting analysis according to student understanding and thinking to find the right solution to the problem.

Minarni (2023) stated that the problem-based learning model is effective in increasing students' interest in learning economics, especially in the material on scarcity. Similar findings by Song (2017) stated that learning using the video-assisted problem-based learning model is more effective in increasing students' motivation and critical thinking skills, thereby improving student learning outcomes. The problems presented by teachers in learning have been shown to increase students' curiosity to find good solutions.

Kristi and Andriani (2023) stated that the development of e-books based on problem-based learning has been successfully developed, and is very feasible and effective in improving the science learning outcomes of grade V students. Research conducted by Zaini, Darmawan, & Hermawan (2019) stated that the use of Digital Book-based teaching materials had a higher effectiveness than printed teaching materials in improving student learning outcomes in Mathematics subjects, Mathematical Logic material in grade X of SMKN 2 Garut.

Learning is designed to teach students. Martin, Sun, & Westine (2020) stated that the problem-based learning model leads students to be more active in finding concepts and solving problems. According to constructivist learning theory, learning is the process

of forming knowledge by the students themselves. Prieto (2023). In the view of constructivism, students will learn well if they can bring learning into the context of what they are learning into application in everyday real life and get benefits for themselves. Learning is designed to teach students. This is by the problem-based learning model where this learning model leads students to be more active in finding concepts and solving problems.

Based on the description above which consists of the gap phenomenon and is supported by several previous studies. This study attempts to examine the combination of learning model approaches and learning media on learning outcomes in the subject of economics on scarcity material. The study will be conducted using a test technique by providing pre-test and post-test questions which are then analyzed and concluded.

The purpose of this study was to determine the learning outcomes of students using the problem-based learning model assisted by video media in the experimental class and assisted by digital book media in the control class and to determine the comparison of the two in improving student learning outcomes in the scarcity subject of class X SMA N 16 Semarang.

METHODS

The type of research used in this study is quantitative research using the experimental research method of the Quasi-Experimental Design type. The population in this study was class X of SMA N 16 Semarang in the 2023/2024 Academic Year. The samples in this study were 2 classes, class X1 as the experimental class and class X2 as the control class, each class numbered 36 students. The 2 classes were taken because they had a low average test score compared to other classes.

The sampling technique used in this study was Purposive Sampling. In sampling, the researcher created sampling criteria where the criteria were the similarity of the average daily test scores which were similar in classes X1 and X2. Class X4 became the trial class for the research instrument.

This study consists of 2 variables, namely dependent variables and independent variables. The dependent variable in this study is learning outcomes, then the independent variables in this study are problem-based learning, video media, and digital book media.

Data collection techniques using tests in the form of pre-test and post-test. The instruments in this study were multiple-choice tests, validity, reliability, a test of question difficulty level, a test of discriminatory power, and a test of question distracting power. The data analysis techniques used were paired sample t-test and independent sample t-Test.

RESULT AND DISCUSSION

The purpose of statistical testing is to provide a summary or description of the research variables. Before being tested, the research instrument must be normal and

homogeneous. Therefore, normality and homogeneity testing must be carried out. Based on the calculation results of 0.200 in the Kolmogorov-Smirnov table, it can be concluded that the data is normally distributed. Then in the homogeneity test, the results were 0.421> 0.05, so it can be concluded that the data does not have different or homogeneous variances.

Data analysis on Hypothesis 1 using SPSS 26 with the Paired Sample t-Test with a 5% confidence level. Based on the results of hypothesis testing 1, the significance value obtained is as big as 0,000, Which It means more smaller than 0.05. Results Study on class experiment experienced an increase as indicated by the average class value at the pre-test and post-test. The increase in learning outcome scores increased from the pre-test by 51.36 to 84.33 on the post-test.

Data analysis on Hypothesis 2 SPSS 26 with the Paired Sample t-Test with a confidence level of 5%. Based on the results of hypothesis testing 2, a significance value of 0.000 was obtained and less than 0.05. The learning outcome value in the control class increased from a pre-test value of 51.36 to 79.16 at the time of the post-test.

Data analysis on hypothesis 3 SPSS 26 with independent samples t-test with a confidence level of 5%. Based on the results of the hypothesis test, it is known that the significance value of learning outcomes is 0.001, which is smaller than 0.05. This is also shown in the comparison of learning outcomes of students in the control class and the experimental class, with an average value pre-test class control as big as 51.36 becoming 79.16, Which means experienced an increase in the average class value of 27.8. The learning outcome value in the experimental class increased from the pre-test by 51.5 to 84.33 at the time post-test, which means experiencing an increase in the average class value by 32.83.

Problem-Based Learning Model Assisted by Video Media on Scarcity Material Can Improve Learning Outcomes of Class X Students of SMA N 16 Semarang

Pre-test and post-test values. Post-test tested with paired sample t-test shows reception hypothesis. This is because the significance value in the experimental class is 0.000 and less than 0.05 so Ha1 is accepted. Increased learning outcomes are indicated by the average class score at the time of the pre-test and post-test. Improvement in learning outcomes This is due to the treatment in the experimental class. Use model learning problem-based learning assisted by video media. Model This learning focuses on students solving problems and finding solutions related to scarcity so that they can practice concepts and understanding. Material-related economy, especially scarcity of material.

The improvement in student learning outcomes in this experimental class proves that the theory of constructivism in learning with the application of the problem-based learning model is in harmony. The theory of constructivism presented by Martin, Sun, & Westine (2020) states that learning is a process of forming knowledge by students themselves. This activity can be seen from students' abilities during the learning process, when students present, discuss, and ask questions, students actively seek sources of knowledge, and materials, and explore their knowledge in depth. In this case, students

become the center of the learning process by confronting them with real problems that must be solved. This method aims to develop critical thinking skills, problem-solving skills, and teamwork skills.

Learning in the experimental class begins with the teacher giving pre-test questions to test students' understanding of the material to be taught, then in the main activity, the teacher shows a learning video about 3 kg LPG gas in the Mijen area. After watching the video, the teacher gives a trigger question about the video that has been shown, students answer the questions then the teacher continues by dividing students into 6 groups and distributing LKPD to each group, then each group discusses the LKPD that has been given. When group activities take place, especially during presentations, in their groups they help each other and students who understand the material better as a whole help other students who do not understand. The learning process using the problem-based learning model assisted by video media can increase self-confidence in the ability to think independently, find information from various sources, and learn from other students.

Qudsyiati (2022) stated that the problem-based learning model based on video media has been proven to improve the quality of learning and has implications for increasing teacher-teaching activities, learning motivation, and learning outcomes. This research is strengthened by research conducted by Sintia and Jasmidi (2022) which states that the use of a problem-based learning model assisted by video media is an alternative that can be used to improve student learning outcomes.

Problem-Based Learning Model Assisted by Digital Book Media on Scarcity Material Can Improve Learning Outcomes of Class X Students of SMA N 16 Semarang

The results of hypothesis 2 testing in this study using pre-test and post-test values tested with paired sample t-test showed acceptance of hypothesis 2. The significance value in the control class was 0.000 and less than 0.05 so $H_a 2$ was accepted. The increase in learning outcomes was indicated by the average class value at the time of the pre-test and post-test. This proves that the problem-based learning method assisted by digital book media has succeeded in improving student learning outcomes. These results are reinforced by research from Kristi and Andriani (2023) stating that the development of digital books based on problem-based learning has been successfully developed, and is very feasible and effective in improving learning outcomes.

This research is also by the theory of constructivism which states that humans build and interpret knowledge from their own experiences. This initial ability will be the basis for building new knowledge. Silva, Purnomo, & Zuhri (2019) stated that the Constructivism approach assisted by e-book media is effective for learning outcomes when viewed from the perspective of students' learning styles.

Research activities in the control class, learning begins with the teacher explaining the learning. The activity continued with the teacher asking questions related to the scarcity of material. Learning is continued with the teacher providing learning objectives, learning materials, and also activities that will be carried out at this meeting, namely

discussing the scarcity that occurs in the area then the Teacher delivers the material in outline. Learning is continued with the teacher divide students into 6 groups to then discuss the LKPD distributed by the teacher. Each group discusses in accordance Worksheet Which has been shared by the Teacher. Activity to be continued with the exposure material by each group. In the control class at the end teacher meeting provides appreciation by giving additional marks for participant education which can motivate participants to educate in the Study.

Problem-Based Learning Model is More Effective in Improving Student Learning Outcomes on the Scarcity Material of Class X SMA N 16 Semarang compared to the Problem-Based Learning Model Assisted by Digital Book Media on the Scarcity Material of Class X SMA N 16 Semarang

Hypothesis 3 testing in this study uses learning outcome value data. Post-test class experiment and class control tested using independent sample t-test. The test results show a significance value of 0.001 on the results of Study students. So, it can be concluded that the implementation model learning problem-based learning assisted by video media is more effective in increasing results Study students on eye lesson scarcity.

Study This is by theory of constructivism, which is Where the level of understanding a student is built based on the experience personal student. The more students are active in belittling problems, the more understanding students willthe more increase. Students continue to find and transfer informationcomplex so that students will find it easier to understand when faced with new problems. In the learning process in the experimental class, students were more actively given problems using video media, compared to withcontrol class.

During the research process, the experimental class used video media while the control class used digital book media. The learning process and learning outcomes using the problem-based learning approach assisted by video media were better than those using the problem-based learning approach assisted by digital book media. These results are supported by research conducted by Mujahidah, Anwar, & Gani (2023) the results of the study showed that learning using problem-based learning can improve student learning outcomes.

CONCLUSION

Based on the results of the study, it can be concluded that the application of the problem-based learning model assisted by video media has been proven to improve student learning outcomes as indicated by an increase in the average value of the experimental class learning outcomes from 51.36 in the pre-test to 84.33 in the post-test. The application of the problem-based learning model assisted by digital book media has been proven to improve student learning outcomes as indicated by an increase in the average value of the control class learning from 51.50 to 79.17. and the application of the problem-based learning model assisted by video media is more effective in improving

student learning outcomes on scarce material compared to the problem-based learning model assisted by digital book media as indicated by the results of the independent samples t-test of 0.001, which is smaller than 0.05.

The suggestion from this study is that the application of video media-based learning can be used as an alternative in improving student learning outcomes, because students more easily understand the material presented and students will more easily repeat the material outside of learning hours.

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