

## Implementation of Supplement Teaching Materials Based on Problem Based Learning to Improve Concept Mastery and Health Care Attitudes

Elis Risyanti<sup>1✉</sup>, Lisdiana Lisdiana<sup>2</sup>, Wiwi Isnaeni<sup>2</sup>

<sup>1</sup>. SDN Sindang 1, Majalengka, Jawa Barat, Indonesia

<sup>2</sup>. Pascasarjana, Universitas Negeri Semarang, Indonesia

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### Abstract

Learning with the 2013 curriculum requires the use of various learning resources, learning media and teaching materials that vary to support the learning process.. These results of the students being constrained in learning the material because the material in the book is too little, so it is difficult to understand. This study aims to analyze the effect of PBL-based supplementary teaching materials on the concept mastery and health care attitude. This study used a quasi-experimental method with nonequivalent control group research design. The samples used were VA and VB SDIT Tazkia Insani classes. The instruments used were tests, attitude scale sheets, observation sheets, interviews, and notes. The results showed that after being given action in the experimental class, students' concept mastery and health care attitudes increased. The conclusions of this study are 1) PBL-based supplementary teaching materials on human respiration affect mastery of concepts. 2) Supplements of PBL-based teaching materials on human respiration influence health care attitudes. 3) Supplements of PBL-based teaching materials on human respiration have a received a positive response from teachers and students. 4) Supplements of PBL-based teaching materials on human respiration have a relationship between concept mastery and health care attitudes.

✉ Correspondence address:

Blok Jum'at, Sindang, Majalengka, Jawa Barat

E-mail: [elisrisyanti69@students.unnes.ac.id](mailto:elisrisyanti69@students.unnes.ac.id)

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## INTRODUCTION

Education is a conscious activity that has a major role in developing students' abilities to become qualified, skilled, innovative, creative human beings and influences changes in personality traits, thoughts, and behavior. Law no. 20 of 2003 concerning the National Education System Chapter I article 1 which states that education is a consciously planned effort to create a learning atmosphere in the learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, morals noble character, as well as the skills needed by himself, the community, the nation, and the state. Law Number 20 of 2003 Basic education is the level of education that underlies secondary education. Basic education is currently experiencing a shift in curriculum. The Ministry of Education, Culture, Research and Technology (Kemendikburistek) issued a Policy to develop an Independent Curriculum which was given to educational units as an additional option in the framework of carrying out learning recovery during 2022-2024. The Ministry of Education and Culture policies regarding the national curriculum will be reviewed in 2024 based on evaluations during the learning recovery period.

The research samples apply to the 2013 curriculum. The learning process in the 2013 curriculum emphasizes the involvement of student activities. Gulo (2022: 335) a planned educational process is needed to create a learning atmosphere and learning process that can make students actively and creatively involved. The learning process is oriented towards the application of learning concepts (learning by doing), prioritizing fifth activities including observing, asking, reasoning, associating, and communicating to increase student creativity. Through this learning, students can achieve a balance between spiritual, social, knowledge, and skills aspects. However, the facts prove that the implementation of learning in schools is not as expected. Some of the problems that occur include the learning

process only focusing on solving the subject matter not on forming understanding and meaningfulness of the subject matter to students.

The problem is that teachers and students only use learning resources provided by the government, namely teacher books and student books. Learning in the 2013 curriculum requires the use of various learning resources, learning media, and various teaching materials to support the learning process. This causes students to feel difficulty because the material in the book is too little so it is difficult to understand. There are also some practice questions for daily tests, midterm tests, and final school tests. This problem is a real result of the learning process which is still not going well and is also not in accordance with the 2013 curriculum.

Based on the problems, the researchers conducted preliminary research, namely reflecting through observation data, documents, and interviews conducted by researchers, so that problems were found regarding the learning process at SDIT Tazkia Insani, Majalengka, Regency, West Java. This is evidenced by the need to add PBL-based teaching materials to human respiration material. SDIT Tazkia Insani only has learning resources in the form of thematic books obtained from the government. Learning activities, teachers and students only use teacher books and student books provided by the government. Teachers and students still need other learning resources that can be used as companion learning resources to improve the learning process and student learning achievement. Yayuk (2019: 174) The intended companion learning resources include teaching material supplements to enrich, add or deepen material on learning.

The 2013 Curriculum learning is packaged in thematic learning which in one lesson consists of two subjects and even three subjects. Of several subjects, one of which is science, science is important to teach students because it has very important benefits for students' lives. The material that students have not yet understood is the basic competence of human respiration. Human respiration material on fifth grade in elementary school has Basic

Competency, namely (3.2) explaining respiratory organs and their functions in animals and humans, as well as how to maintain the health of respiratory organs, and (4.2) making simple models of human respiratory organs. Lestari, Pasani & Yulinda (2022:67) with the Covid-19 pandemic attacking the human respiratory system, it is increasingly urgent that students need to understand the material for respiratory system disorders in humans in learning. To anticipate respiratory problems, it is necessary to have a health care attitude. The attitude of caring for health is found in learning in class V with Basic Competency 3.2 and KD 4.2 Basic Competence about human respiration. But the implementation of learning is not relevant to the expected goals.

Based on these constraints, it is necessary to supplement problem-based teaching materials. Ajizah & Artayasa (2022:148) problem-based learning a teaching model that is characterized by real problems as a context so that students learn to think critically and problem-solving skills and acquire knowledge. Supplement of teaching material can be used by teachers and students. This teaching material supplement can be used by students at school or home. Teaching materials have a very important role in the learning process, to help achieve learning objectives. The teaching materials that will be implemented in this study are PBL-based teaching materials. The use of PBL-based teaching material supplements is carried out with the consideration that students can learn to solve problems related to human respiratory in accordance with everyday life. With the addition of PBL-based teaching materials, it can make it easier for students to master the concept of human respiration and health care attitudes. Isnaeni & Indriyati (2022: 81) Supplements of PBL-based teaching material are suitable for implementation in learning both as a companion and as a main source, because the subjects presented are adapted to cognitive abilities and attractive designs so students don't get bored while learning.

The formulation of the problem raised in this study is how does the PBL-based

supplementary teaching material influence the mastery of the concept of human respiratory material? how does the PBL-based supplementary teaching material influence health care attitudes?, how do teachers and students respond to PBL-based supplementary teaching material?, and What is the relationship between concept mastery and health care attitudes?

The purpose of this study was to analyze the effect of PBL-based supplementary teaching materials on mastery of the concept mastery and health care attitudes. This research is expected to provide benefits, especially in learning the human respiratory system by applying PBL-based teaching material supplements as additional or complementary learning resources that are more interesting and effective, so that students can master the concepts in the human respiratory system material.

## METHODS

The method to be used in this study is a quasi-experimental. The research design was a nonequivalent control group design. nonequivalent control group design was applied because the selection of groups was not chosen randomly but based on several considerations in accordance with the research objectives. The population of this study were fifth grade students at SDIT Tazkia Insani, Panyingkiran District, Majalengka Regency. Sampling using purposive sampling technique. The subjects of this study consisted of 38 fifth grade students at SDIT Tazkia Insani Majalengka. The VA class was selected as the control class and the VB class was selected as the experimental class.

The research design uses two classes, namely the control class and the experimental class. The control class will be given learning using the PBL model and teaching materials that are already available at school. The experimental class was given learning using the PBL learning model and was equipped with PBL teaching materials on human respiratory material to improve mastery of concepts and health care attitudes.

The research design uses two classes, namely the control class and the experimental class. The control class will be given learning using the PBL model and teaching materials that are already available at school. The experimental class was given learning using the PBL learning model and was equipped with PBL teaching materials on human respiratory material to improve mastery of concepts and health care attitudes. Techniques of data collection through tests to determine the ability to master the concept, attitude scale sheets to determine health care attitudes, observation sheets to determine student activity, interviews, and field notes to determine student responses. The research data were analyzed using quantitative data and qualitative data. Quantitative data were analyzed using the T-test and correlation test. Qualitative data were analyzed by means of data collection to be described to obtain a conclusion.

## RESULTS AND DISCUSSION

The results of research on mastery of the concept and health care attitudes analysis before and after being given action. This study aims to determine and analyze the results of concept mastery in the experimental class and control class. Analysis of pretest and posttest scores was used to determine the increase in students' mastery of concepts in the experimental class and control class.

During the preparation and planning stages the researcher prepared a Learning Implementation Plan (RPP), a supplement of problem-based teaching materials on human respiration, observation sheets of student activities, pre-test and post-test questions, interview guidelines, and field notes.

The research was started by giving a pretest to students in the experimental class and control class. Magdalena, et al (2021: 26) pretest is a test carried out before learning with the aim of knowing students' initial competence regarding teaching material. Then both classes were given treatment. The experimental class used PBL-based teaching material supplement

while the control class used teaching materials available at school.

Nasri & Jamaan (2022:142) and Nisa, Sarwi, & Subali (2021:456) stated that PBL-based learning has stages, namely introducing students to the problems presented, grouping students on problems, directing students on carrying out an investigation both independently or groups, presenting and developing products, evaluating and analyzing problem solving activities.

The first stage, orienting the problem by dividing students into 4 groups, asking students to read books. (observing), distributing teaching material supplements to each group, analyzing teaching material supplements (observing), baiting students to ask questions, and guiding students to answer questions.

Stage two, the activity of organizing students to learn through activities guiding students to understand respiratory material through supplementary teaching materials, identifying the functions of the respiratory organs in humans, making a chart of the functions of the respiratory organs in humans, discussing health problems in the human respiratory organs, and mentioning health problems human respiratory organs.

The third stage, activities to assist group investigations consist of discussing the causes of respiratory disorders, conducting discussions regarding cases that cause respiratory disorders, communicating the results of the discussions, and telling how to care for the respiratory organs. Teachers in helping students when experiencing difficulties in investigating problems in groups.

Stage four, the activity of developing and presenting the work through the activity of filling in word games and presenting teaching material supplements, making a chart of the functions of the respiratory organs in humans, and students presenting the results of group work.

Stage five, activities to analyze and evaluate learning by means of the teacher reflecting on learning. After that, a posttest was carried out in the experimental class and the control class. The results of students' mastery of

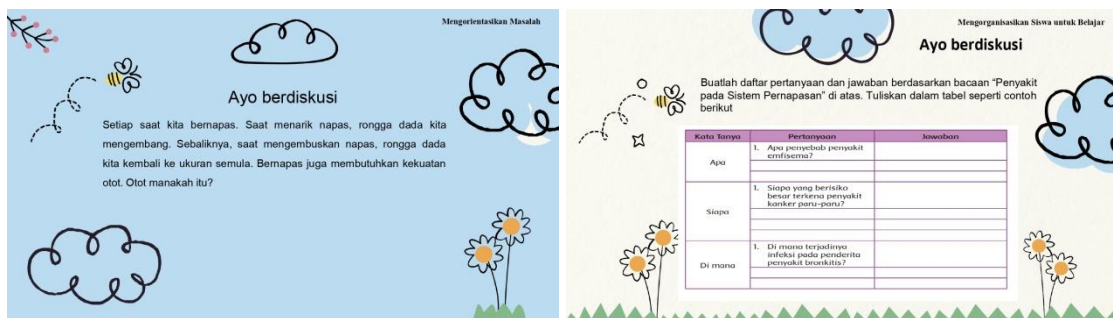
concepts are shown in Table 1. The results of pretest and posttest mastery of concepts.

**Table 1.** Concept Mastery Pretest and Posttest Results

Classes	Experiment Pretest	Control Pretest	Experiment Posttest	Control Posttest
Mean	53,5	65,6	81,5	73,4
Upper	79	79	94	85
Lower	36	45	76	52
Total	1017	1247	1550	1396

Based on Table 1, it is known that students' initial mastery of concepts in the experimental class is smaller than the control class. After being given the treatment, it was found that the post-test results in the experimental class were greater than the control class.

The difference can be seen from the average pretest result of 53.5 and the average posttest result in the experimental class of 81.5. The average pretest result for the control class was 65.6 and the average posttest result was 73.4. The increase in the average score of students in the experimental class was 28, while the average score in the control class increased by 9.9. These results show that supplementary teaching materials improve students' concepts mastery. Student activities that are very prominent related to the concepts mastery of the human respiratory system at the stage of orienting the problem and organizing students for learning are shown in Figure 1.



**Figure 1.** Orienting Problems and Organizing Students for Learning

The problem-orientation phase, students are faced with statements related to human respiratory. Students with the guidance of researchers began with activities to understand human respiration. Students carry out activities asking one of the questions related to the way humans breathe. This activity encourages students to understand human respiration. Students also enthusiastically answered questions from researchers regarding the muscles that affect human respiration.

The stage of organizing students for learning is carried out with discussion activities

about various disorders of the human respiratory organs. Some students answered various disorders of the human respiratory organs that are outside the reading text in the supplement, such as lung cancer. At this stage students carry out activities by answering various questions related to respiratory disorders in humans.

After the activities were carried out by giving treatment to the experimental and control classes, a statistical test was carried out so that the results of the analysis were more relevant by calculating the pretest-posttest results of the experimental class and control class in Table 2.

**Table 2.** Normality Test Results, Homogeneity Tests, and T-Tests of Concept Mastery

Classes	Normality Test	Homogeneity Test	Independent T-Test
Experimen	Normal (0,258)	Homogen (0,229)	Difference (0,000)
Control	Abnormal (0,014)		

Based on Table 2, the data is not normally distributed, and the data is homogeneous, which is assumed to have the same variance. Calculation of the t-test from the results of the post-test ability to master the concept can be seen that there are differences in the ability to the students' concepts mastery between the experimental class and the control class. These results conclude that supplementary teaching materials based on PBL can improve students' concepts mastery.

Several relevant studies are in line with the research results, Nursyeli & Puspitasari (2021: 327) mastery, namely the ability of a person to understand or understand something after something is known or remembered includes the ability to grasp the meaning of the material being studied, which is expressed by describing the main content of a reading, or changing data presented in a certain form to another form, Suendarti & Liberna (2021: 329) explained that concept is something that is stored in the human mind or mind in the form of an idea or idea. Suryani (2019:67) and Zulmi (2019:314) revealed that mastery of the concepts achieved must be adjusted from the easiest level to the most difficult level so that students are able to fully understand the concept. Based on the explanation of several experts, mastery of the concept is the student's ability to remember, interpret, memorize, and know the ideas or ideas that are learned and then applied in the real life of everyday students from the easy level to the most difficult level.

The research was carried out by conducting pre-tests, giving treatments, and post-tests to determine the increase or decrease in students' mastery of the initial concepts. This study uses teaching material supplements. Djuwita (2020:16) said that teaching material supplements are used to enrich teaching materials used in learning, especially human

respiratory. The use of teaching material supplements is intended to determine the increase or decrease in students' mastery of concepts. The teaching material supplement used is a PBL-based teaching material supplement. Sari & Yustiana (2021: 178), explained that effective and efficient teaching materials will assist in teaching and learning activities. Teaching material supplements can be effective and efficient because they focus on teaching and learning activities for students. Some of the studies above support the use of PBL-based teaching material supplements.

The pretest was given once before being given treatment. The implementation stage of learning is carried out during one lesson. Learning begins with an introduction that contains an introduction before starting learning so that students can focus on the core learning activities. The core learning activities use supplemental PBL-based teaching materials with activities consisting of orienting students to problems related to teaching materials, organizing students for learning, assisting individual and group investigations, developing, and presenting work results, analyzing and evaluating problem-solving processes.

The posttest was carried out once after completing teaching materials on concept mastery.. Post-test results were obtained with the lowest scores in the experimental class 76 and 52 in the control class. The highest scores were in the experimental class 94 and the control class 85. The average post-test results in the experimental class were 81.5 and the average post-test in the control class was 73. 4. The result of the independent t-test is 0.000 which means that there are differences in the ability to master the concept. The difference in the average post-test results stated that students who used teaching material supplements experienced an increase in concept mastery. Students who used

teaching material supplements in the experimental class experienced a significant increase compared to the control class.

Several relevant studies have links with increasing mastery of the concepts in this study. The research was conducted by Susilowati & Wicaksono (2019: 13) revealed that by using e-learning teaching material supplements with the blended learning method for mastering concepts. The stages in blended learning learning are orientation, formulating problems, making hypotheses, designing experiments, conducting experiments, collecting data, analyzing data, and finally making conclusions. The orientation phase for designing the experiment was carried out online while the experimental activities for concluding were carried out face to face. The similarity of teaching material supplements that use the blended learning method with PBL-based teaching material supplements is solving problems, collecting data, analyzing data and making conclusions. Posttest results obtained from the use of supplementary teaching materials using the blended learning method as many as 28 students scored above the minimum completeness criteria, and 7 students scored below the minimum completeness criteria. These results state that the use of complementary teaching materials in teaching materials influences increasing students' mastery of concepts.

Atmojo & Kurniawati (2019:51) conducted research on thematic teaching materials with an insight into science environment technology and society (SETS) to improve mastery of concepts. SETS is a unit that in the educational concept has an implementation so that students have higher order thinking skills. SETS is learning that comes from discovery learning. PBL has similarities with discovery learning, namely learning that is done to solve problems. Problem solving will direct students to think at a higher level, one of which is concept mastery. Statistical test results used a t test of 0.05 which stated that SETS vision teaching materials proved effective in increasing students' mastery of disaster mitigation concepts.

Nurmaya et al (2021: 150) developed a guided inquiry learning model on optical devices to improve mastery of concepts. Learning tools include inquiry-based teaching materials. The stages in inquiry emphasize the process of critical thinking to seek and find answers to a problem that is asked, it is hoped that by seeking and finding conceptual knowledge through experiments on material. PBL and inquiry have a relationship in the stages of problem solving, it's just that inquiry emphasizes learning by seeking information without the help of a teacher. The results obtained were 3 students with high gain values, 8 students with medium gain values and 4 students with low gain values. based on these results that teaching material supplements that use problem-solving steps help students master the concepts of teaching materials.

Ramadhani & Isnaeni (2022: 260) explained that PBL based E-LKPD (electronics students' worksheet) is implemented in learning. PBL-based E-LKPD focuses on problem solving which aims to facilitate students' understanding of concepts. The potential of e-LKPD in facilitating students' conceptual understanding skills is obtained from student work and posttest results. The results of student work in working on the e-LKPD showed a good category with a percentage of 80.31% (XI MIPA 4) and 82.83% (XI MIPA 6). This study shows that PBL-based E-LKPD helps students improve mastery of concepts. Putra, Susilowati, & Purwanto. (2021: 245) learning using the PBL model can improve student learning outcomes with an increase of 77.4. PBL learning with the help of other media is more effective for increasing mastery of teaching materials.

Based on the results of relevant research, it was concluded that PBL-based teaching material supplements which have a process of orienting problems, organizing students for learning, assisting group investigations, developing, and presenting work results, as well as analyzing and evaluating learning can help students improve their concepts mastery.

The health care of attitudes are obtained from giving an attitude scale at the beginning

and at the end of the activity. Initial and final analyzes on the health care attitude scale were used to determine the increase in health care attitudes in the experimental class and the control class. The experimental class used teaching material supplements based on PBL while the control class used teaching materials available at school.

Widyaningrum & Prihastari (2018:24) said that caring is an attitude and action that always tries to prevent and develop efforts to repair the damage that has occurred. Fitriati, Sahputra & Lestari (2019:2) stated that caring attitude can be efforts to preserve, prevent and improve. Sartika (2022:1) explained that health is a perfect condition both physically, mentally, and socially, to avoid various diseases. Based on the experts, it was concluded that the attitude of caring for health is an attitude and action to prevent, develop and improve which aims to form a healthy state physically, mentally, spiritually, and socially to create oneself and a healthy environment. Health care attitudes will be applied to elementary school students.

The initial activity was carried out by giving a health care attitude scale sheet pretest to determine students' initial attitudes. The next activity is implementing a health care attitude in learning activities by using teaching material

supplements. The stages in learning activities are adjusted to the RPP, teaching material supplements, and the health care attitude scale. Aspects consisting of aspects of a person's attitude towards disease, attitude towards food, and attitude towards environmental health. Aspects of a person's attitude towards disease have indicators of attitudes towards improving and maintaining health, including boundaries, always breathing fresh air, exercising regularly, always wearing a mask, always avoiding dust, and always avoiding substances that can damage the health of the respiratory organs. The aspect of attitude towards food consists of an indicator of attitude towards food as a statement of the health need to live and always eat nutritious food. The attitude aspect towards environmental health consists of indicators of a person's attitude towards the environment which include always cleaning the home environment, always cleaning the classroom, always cleaning the school yard, and often planting trees. The third aspect is implemented in learning through PBL-based teaching material supplements.

fter being given treatment, the final ability to care for health in the experimental class and control class. The results of the experimental and control classes regarding health care attitudes are shown in Table 3.

**Table 3.** The Pretest-Posttest Results of Health Care Attitude Scale Sheet

Classes	Experiment Pretest	Control Pretest	Experiment Posttest	Control Posttest
Mean	20,1	27,8	39,2	34,9
Upper	25	32	44	40
Lower	17	22	30	29
Total	383	529	746	663

Based on Table 3, the initial ability to care for health in the experimental class is smaller than the control class. Then the experimental class was given treatment while the control class was not given treatment. After being given treatment, it is known that the final ability of health care attitude in the experimental class is higher than the control class. The difference can be seen from the results of the health care attitude scale sheet in the experimental class with an average of 39.2 while the control class is

34.9. The increase in the average score of students in the experimental class was 19.1, while the average score in the control class increased by 7. The difference in the average post-test results stated that the attitude of caring for the health of students in the experimental class was greater than that of the control class. Activities that are very visible from the use of PBL-based teaching material supplements at the stage of guiding group investigations in Figure 2.





Figure 2. Guiding Group Investigations

Figure 2 describes the activities of guiding group investigations related to health care attitudes. Students at this stage conduct investigations regarding the dangers of smoke from burning waste to human respiratory. Students also solve problems related to fresh air and air that is not fresh in the home

environment. This stage also invites students to maintain the human respiratory organs.

To make the analysis results more accurate, a statistical test was carried out regarding health care attitudes in Table 4: normality test, homogeneity test, and t-test

Table 4. Results of Normality Test, Homogeneity Test, and t-Test

Classes	Normality Test	Homogeneity Test	Independent T-Test
Experimen	Abnormal (0,017)	Homogen (0,257)	Difference (0,000)
Control	Normal (0,479)		

The data on Table 4 states that the distribution is not normal and homogeneous, which means that there are similarities in variance. The results of the T-test stated that there were differences in health care attitudes between students in the experimental class and students in the control class. Based on these results, PBL-based teaching material supplements can improve students' health care attitudes.

Some relevant research on health care attitudes. Karina & Lisdiana (2022: 164) research aims at the attitude of students from an early age to refuse to use shisha so that in the future it is hoped that students will not smoke shisha and/or refuse invitations to smoke shisha through additional teaching materials for the respiratory system based on shisha research. The results of the questionnaire analysis of students' attitudes after being given respiratory system teaching material supplements showed that 73.3% of students had a very high attitude of rejecting shisha and 26.6% responded very highly. This shows that with the addition of

teaching materials students obtain sufficient knowledge about the dangers of shisha smoke, student responses to avoid or refuse shisha cigarettes are high. This study has similarities with using teaching material supplements given to students to be able to direct students to avoid attitudes that damage human respiratory disorders.

Adystia, Lisdiana & Yuniastuti (2022: 377)said that research on the development of teaching supplements "when vape means fire" for learning respiratory system disorders. This research aims to develop teaching material supplements to prevent vape use behavior to prevent human digestive system disorders. Student responses with a percentage of 92.5% were interested in using teaching material supplements to prevent the use of vape which can interfere with human respiratory. Teaching material supplements have similarities in this study which aims to master the concept of the dangers of carrying out activities that can interfere with human respiratory organs.

Isnaeni, Lisdiana, & Angraeni (2019: 3) research on the relationship between smoking behavior and high school student learning outcomes on the respiratory system using PjBL. Learning through PjBL teachers can facilitate students in inviting them to live a healthy life without smoking. Recognition of the dangers of smoking is not only obtained from teachers, videos, books, or literature studies but also from parties who can be accounted for according to their fields. This makes students have strong guidelines in self-control, so they don't get caught up in smoking behavior that damages health. The results obtained in this study averaged 92.4, which means that most students mastered the concept of the dangers of smoking to health. The similarity with research, at the PjBL stage the activity begins with determining

basic questions and in PBL there is a problem orientation stage that directs students to solve problems in avoiding behaviors that lead to respiratory system health.

Based on several relevant research supports; it can be concluded that PBL-based teaching material supplements can improve students' health care attitudes. Supplementary teaching materials must contain the values of caring for health so that students consciously carry out learning to avoid behaviors that can damage respiratory health.

The correlation between the two variables can be determined by calculating the correlation coefficient of the final value of concept mastery and health care attitude. The results of the normality test, and the pearson's product moment test are in Table 5.

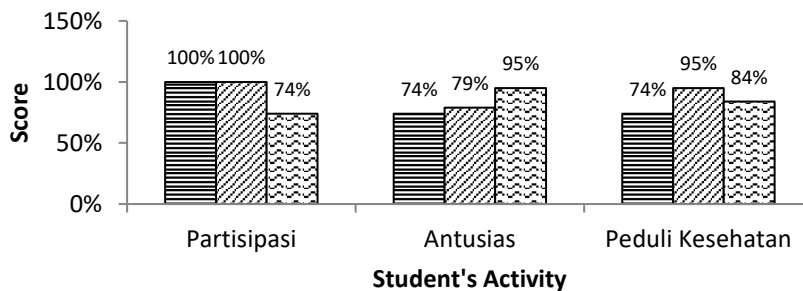
**Table 5.** Results of Statistical Tests for Mastery of Concepts and Health Care Attitudes

Variabel	Normality Test	Corelation	Pearson's Product Moment Test
Concepts Mastery	Abnormal (0,029)	0.382 (Weak)	0.107 (Weak)
Health Care Attitudes	Normal (0,279)		

Based on Table 5, it explains that the data are not normally distributed, and the relationship between the ability to master the concept and the attitude of caring for health is in the weak category, and vice versa. Ahmadi, Surbakti, & Jalmo (2018: 5) explained that research on the relationship between environmental knowledge and caring for the environment. The results obtained show that the relationship between environmental knowledge and environmental care attitude is only 25%. The similarity with this research is the relationship between material mastery ability

and caring attitude at a low level. Students who have high mastery of concepts experience an increase in health care attitudes in the weak category.

Student responses were obtained from student observation sheets related to additional teaching materials. These aspects consist of enthusiasm for the use of teaching material supplements, participation in the use of teaching material supplements, and health care attitudes. This section will present the results of various student responses. which is presented in Figure 3 below.



**Figure 3.** Observation Sheet Result Diagram

Figure 3 shows student participation in the use of additional teaching materials, students' enthusiasm for using additional teaching materials, and student attitudes related to health care.

Interviews were used to find out student responses to the application of teaching material supplements in learning. The results of interviews related to mastery of concepts, namely teaching material supplements help in mastering material about the human respiratory system, teaching material supplements help students describe various factors that can cause disorders of human respiratory, and teaching material supplements help students to be able to express various ways to care for the human respiratory system. The results of interviews about health care attitudes, namely students have a caring attitude to protect human respiratory organs, students apply a caring attitude to maintain human health, one of which is using a mask when they are close to their classmates to prevent interference with human respiratory organs, and students have an attitude of maintaining a healthy environment by cleaning the classroom at the break. Based on these interviews, PBL-based teaching material supplements can be responded to by both teachers and students.

Field notes obtained related to conditions and events during learning by using PBL-based teaching material supplements with the results of field notes, namely the teacher giving examples by using masks as a way to protect human organs, teaching material supplements help students to carry out learning activities that focus on students (student center), the teacher stimulates students so that they are not awkward in asking questions, students are reminded to use Indonesian in carrying out learning activities, Suru conditions students in forming groups so that students regularly form their own groups, students are reminded to always wear masks and be on guard distance when discussing, and other notes outside of learning related to the condition of the school which has only a few green areas because it is located in an urban area. Based on these various field notes, it was found that

students were helped using PBL-based teaching material supplements.

## CONCLUSION

Based on the results of the research and discussion, it can be concluded that supplementary PBL-based teaching materials on human respiratory influence the mastery of concepts and health care attitudes. Supplements of PBL-based teaching materials on human respiratory material were responded positively by teachers and students. PBL-based teaching material supplements on human respiratory have a relationship between concept mastery and health care attitudes.

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## REFERENCES

- Adystia, Y., Lisdiana, L., & Yuniastuti, A. (2022, October). The Development of Teaching Supplement" When Vape Means Fire" for Respiratory System Disorders Learning at SMA Negeri 1 Bumiayu. *International Conference on Science, Education, and Technology*, 8(1321): 377-382.
- Ahmadi, R., Surbakti, A., & Jalmo, T. (2018). Hubungan pengetahuan lingkungan hidup dengan sikap peduli lingkungan hidup. *Jurnal Bioterdidik: Wahana Ekspresi Ilmiah*, 6(2): 1-10.
- Ajizah, E., & Artayasa, I. P. (2022). Validitas Bahan Ajar IPA Berbasis Problem Based Learning Untuk Meningkatkan Keterampilan Berpikir Kritis dan Sikap Ilmiah Peserta Didik. *Journal of Classroom Action Research*, 4(2): 121-127.

- Arif, E., Suryadi, A., Nurdiana, D., Julianti, E., & Nursantika, D. (2022). Optimasi Penggunaan Microsoft Office Untuk Guru di Smpn 2 Pakuhaji Kabupaten Tangerang Indonesia. Diseminasi: *Jurnal Pengabdian kepada Masyarakat*, 4(1): 15-25.
- Atmojo, S. E., & Kurniawati, W. (2019). Keefektifan Bahan Ajar Tematik Bervisi Science Environment Technology and Society Dalam Meningkatkan Penguasaan Konsep Mitigasi Bencana. *PSEJ (Pancasakti Science Education Journal)*, 4(1): 46-54.
- Djuwita, P. D. (2020). Peningkatan Kemampuan Guru Sekolah Dasar Mengembangkan Bahan Ajar Berbasis Nilai dan Lingkungan. *Jurnal Mutiara Pendidikan Indonesia*, 5(1): 14-19.
- Fitriatul .(2019). Pengembangan Bahan Ajar Tematik Media Pembelajaran berbasis Lectora Inspire pada Kelas 4 SDN Cilegon 1. *Jurnal Dimensi Pendidikan dan Pembelajaran*, 7(2):74-85.
- Gulo, A. (2022). Penerapan Model Pembelajaran Problem Based Learning Dalam Meningkatkan Motivasi dan Hasil Belajar IPA. *Educativo: Jurnal Pendidikan*, 1(1): 334-341.
- Handayani, R., Nurhayati, S., & Taufiq, M. (2016). Pengaruh Pendekatan Jelajah Alam Sekitar Berbantuan LKS PBL terhadap KPS Siswa. *Unnes Science Education Journal*, 5(2): 1198-1204.
- Isnaeni, W, Lisdiana, & Anggraeni, D . (2019). Smoking behavior and learning outcomes in student of senior high school on respiratory system with PjBL. *International Conference on Science, Education, and Technology*, 8(1321): 1-5.
- Karina, S. D., & Lisdiana, L. (2022). The Research-Based Respiration System Teaching Material Supplements to Improve Attitudes Refuse Shisha. *Journal of Biology Education*, 11(2), 164-170.
- Lestari, A., Pasani, C. F., & Yulinda, R. (2022). Pengembangan Media Pembelajaran Interaktif Berbasis Articulate Storyline pada Materi Gangguan Sistem Pernapasan Manusia untuk Kelas VIII SMP. *Jurnal Pendidikan Sains dan Terapan*, 2(1): 66-78.
- Magdalena, I., Annisa, M. N., Ragin, G., & Ishaq, A. R. (2021). Analisis penggunaan teknik pre-test dan post-test pada mata pelajaran matematika dalam keberhasilan evaluasi pembelajaran di sdn bojong 04. *Nusantara*, 3(2): 150-165.
- Nasri, R., & Jamaan, E. Z. (2022). Pengembangan Lembar Kerja Peserta Didik (LKPD) Berbasis Problem Based Learning (PBL) Untuk Meningkatkan Kemampuan Komunikasi Matematis Peserta Didik SMP. *JEMS: Jurnal Edukasi Matematika dan Sains*, 10(1), 140-148.
- Nisa, G., Sarwi, S., & Subali, B. (2021). An Analysis of Problem-Based Learning Activities in Improving Students' Critical Thinking Skills and Intrapersonal Intelligence. *Journal of Primary Education*, 10(4), 449-460.
- Nurmaya, Y., Susilawati, S., Zuhdi, M., & Hikmawati, H. (2021). Pengembangan Perangkat Pembelajaran Model Inkuiri Terbimbing Pada Materi Alat-Alat Optik Untuk Meningkatkan Penguasaan Konsep Fisika. *ORBITA: Jurnal Kajian, Inovasi dan Aplikasi Pendidikan Fisika*, 7(1): 147-154
- Nursyeli, F., & Puspitasari, N. (2021). Studi Etnomatematika pada Candi Cangkuang Leles Garut Jawa Barat. *Plusminus: Jurnal Pendidikan Matematika*, 1(2): 327-338.
- Putra, I. D., Susilowati, S. M. E., & Purwanto, E. (2021). The Effectiveness of Problem-Based Learning Model and Role Playing Assisted by Audio-Visual Media in Learning Outcomes of Social Studies at Fifth-grade Elementary School. *Journal of Primary Education*, 10(2), 240-251.
- Ramadani, B., & Isnaeni, W. (2022). PBL-Based e-LKPD (Problem Based Learning) to Facilitate Student Concept Understanding on Human Sense System Materials. *Journal of Biology Education*, 11(2): 254-262.

- Ridwanulloh, A., Suyahmo, S., & Utomo, C. B. (2022). The Effects of a Problem-Based Learning Model Aided by Mind Mapping on Self-directed Learning in Elementary School Students. *Journal of Primary Education*, 11(1), 1-13.
- Sari, W. N., Yamin, M., & Khairuddin, K. (2023). Perbandingan Model Pembelajaran Kooperatif Tipe Student Team Achievement Divisions (STAD) dengan Model Pembelajaran Problem Based Learning (PBL) Berbantuan Power Point terhadap Hasil Belajar Biologi Siswa Kelas XI IPA SMAN 1 Batukliang Tahun 2022. *Jurnal Ilmiah Profesi Pendidikan*, 8(1), 112-118.
- Sari, Y., & Yustiana, S. (2021). Efektivitas bahan ajar cerita bergambar bemuatan religius terhadap prestasi belajar siswa kelas 1 sekolah dasar. *Jurnal Ilmiah Pendidikan Dasar*, 8(2): 175-185
- Sartika, S. K. M. (2022). Konsep Dasar, Ruang Lingkup Dan Tujuan Ilmu Kesehatan Masyarakat. *Ilmu Kesehatan Masyarakat*, 1-90.
- Suendarti, M., & Liberna, H. (2021). Analisis pemahaman konsep perbandingan trigonometri pada siswa sma. *JNPM (Jurnal Nasional Pendidikan Matematika)*, 5(2): 326-339.
- Suryani, N. P. A., Susilawati, S., & Kosim, K. (2019). Pengaruh Model Pembelajaran *Conceptual Understanding Procedures* terhadap Penguasaan Konsep Fisika Ditinjau dari Sikap Ilmiah Peserta Didik Kelas X. *Jurnal Pendidikan Fisika Dan Teknologi*, 5(1): 64–73.
- Susilowati, D., & Wicaksono, B. A. (2019). Pengembangan media e-learning dengan schoology sebagai suplemen pembelajaran materi fluida statis. *Jurnal Pendidikan Teknologi Informasi dan Vokasional*, 1(1): 8-16.
- Widyaningrum, R., & Prihastari, E. B. (2018). Implementasi Model Pembelajaran *Talking Chips* Disertai Media Fotonovela Untuk Meningkatkan Sikap Peduli Lingkungan dan Kemampuan Menyampaikan Pendapat Mahasiswa. *Jurnal Pendidikan Dasar Dan Pembelajaran*, 8(1): 22-30.
- Yayuk, E. (2019). Pengembangan bahan ajar pembelajaran matematika untuk mahasiswa PGSD Semester 6. *Scholaria: Jurnal Pendidikan dan Kebudayaan*, 9(2), 172-182.
- Zulmi, C. P., & Sahidu, H. (2019). Pengaruh Model Pembelajaran *Conceptual Understanding Procedures* (CUPS) dengan Teknik *Problem Solving* terhadap Penguasaan Konsep Fisika Peserta Didik Di SMAN 7 Mataram. *Jurnal Pendidikan Fisika dan Teknologi*, 5(2), 310-318.