International Journal of Academic Research and Development
www.allstudiesjournal.com
ISSN: 2455-4197
Received: 21-04-2025, Accepted: 22-05-2025, Published: 06-06-2025
Volume 10, Issue 3, 2025, Page No. 21-28

The influence of problem based learning and SAVI learning strategies on student learning outcomes at SMP Negeri 6 Tondano

Jusriwanti, Anatje Lihiang, Meike Paat, Herry Maurits Sumampouw, Jovialine A Rungkat
Faculty of Mathematics, Natural Sciences, and Earth, Manado State University, Tondano, Indonesia

Abstract
A study has been conducted on the influence of problem based learning and SAVI learning model strategies on the topic of plant reproduction systems on student learning outcomes in class IX of SMP Negeri 6 Tondano. This research is an experimental study, which is categorized as a quasi-experiment. This research was conducted twice, namely before and after treatment. Data analysis techniques used normality tests, homogeneity tests, and hypothesis tests. The results showed that Problem Based Learning (PBL) was proven to improve student learning outcomes through five structured syntaxes, starting from problem identification, group work, guidance, to presentation and evaluation that encourage understanding of critical thinking concepts and active problem solving. SAVI learning improves student learning outcomes through four integrated syntaxes, where at the preparation, delivery, training, and presentation stages. Each stage combines SAVI learning styles in a balanced way, this process encourages communication, creativity, critical thinking, and student self-confidence and creates active and contextual learning experiences that are relevant to the real world. The interaction of PBL and SAVI has been shown to improve student learning outcomes. The combination not only strengthens conceptual understanding, but also develops critical thinking skills, communication, problem solving, and the relevance of learning to real life. PBL and SAVI create more comprehensive, enjoyable, and meaningful learning. Learner-centered learning, especially involving problem solving and the activation of various learning modalities, can significantly improve learning outcomes compared to conventional learning.

Keywords: Problem based learning, savi, learning outcomes, students

Introduction

The development of the 21st century is marked by the use of information and communication technology which is used in almost all areas of life. The many possibilities are supported by technology and access to various information that is very easy, as well as a very fast process (Redhana, 2019) [21]. The impact of the changes in this century has resulted in an increasingly automatic order of human life continuity, giving rise to complex social problems. Social problems that arise usually come from concepts, techniques or technologies in science. As a result, there will be continuous challenges, especially in the field of education, to prepare students as the next generation of the nation who are capable, experienced and competent in their fields.

The education system is required to be able to produce graduates who not only have strong academic knowledge, but also critical thinking skills, are able to solve problems, are creative, have communication skills, and collaborate effectively. Efforts to improve the quality of education continue to be carried out through various policies and innovations in the national education system, one of the main focuses in improving the quality of education is the development of effective and innovative learning strategies that can significantly improve student learning outcomes.

Education is the main foundation in the development of the nation and state, and is an important key to achieving progress in various sectors of life. In the context of education, the main focus is on the effective and efficient learning process, especially in facing the challenges of the modern era that continue to develop rapidly. Improving the quality of education is a must in order to produce the next generation who are competent, creative, and able to compete globally (Tampinongkol, Paat & Lihiang, 2022) [25, 19].

One of the subjects that has a crucial role in education is Natural Sciences (IPA). Science learning at the Junior High School (SMP) level has a crucial role in creating students' understanding of aspects of life, the environment, and the relationship between living things and their environment. Therefore, the learning model strategy is very important in achieving goals. The learning model is able to create an interesting and enjoyable learning atmosphere, and makes it easier for students to master concepts that can support and increase students' learning motivation (Paat, Kawuwung, & Mokalu, 2021) [17]. Based on the results of initial observations on Tuesday, May 28, 2024, students in class IX of SMP Negeri 6 Tondano showed that learning outcomes were still relatively low with an average of 60.00 in two classes totaling 30 students. The results showed that there were errors in students in describing, developing, solving problems, and evaluating the learning process, resulting in learning outcomes still being relatively low.

Based on the results of the interview with the science teacher of SMP Negeri 6 Tondano on Thursday, May 30, 2024, it was stated that students were less interested and creative in science learning, the difficulties experienced by students were the lack of problem-solving skills in learning. This is because the learning activities that take place in the classroom emphasize memorizing information, students' brains are forced to observe and accumulate various information without being required to understand the information they remember to connect it to everyday life. The existence of this factor makes students not yet accustomed to developing the skills they have and the lack of cognitive experience of students to solve existing problems. This is also evidenced by the learning outcomes of students which are classified as low, where out of 30

students who achieved learning completeness only 18 people (60%). There are still many students whose average scores have not reached the Minimum Completion Criteria (KKM) set by the school, which is 70. In addition, the use of the surrounding environment as a learning resource to find solutions to problems is also still not optimal and the learning process still tends to memorize concepts or theories.

The learning process that is only oriented in one direction can result in a lack of understanding of students regarding the material being taught and the mastery of skills that should be mastered is not fulfilled, thus impacting the achievement of student learning outcomes that do not achieve minimum completeness. This indicates that the understanding that students have has not been fully studied properly, especially in learning models that are mostly dominated by teachers, so that students tend to be passive and the skills possessed by students are not empowered properly. As a result, this has an impact on the development of students' cognitive learning outcomes and shows the low learning outcomes of students obtained (Rahmadianti, 2020). In the last few decades, various innovative learning models have emerged that aim to improve the quality of the learning process and student learning outcomes. Two of the learning models that have received attention in the world of education are Problem Based Learning (PBL) and the Somatic, Auditory, Visual, Intellectual (SAVI) learning model.

PBL places students as active subjects in the learning process, where they are faced with concrete problems and encouraged to find solutions based on the understanding and knowledge they have and develop. Through this learning model, students are encouraged to become independent and critical learners, and improve their analytical thinking skills. This is in line with previous research conducted by (Kembuan, Tumbel, & Paat, 2019) [12], that the PBL learning model is one model that can make students active in learning and create a fun learning atmosphere. This model is also a learning model that emphasizes problem solving given by teachers based on information that students have, especially for science learning. In addition to the PBL learning model, the SAVI model emphasizes optimizing all senses in the learning process. This approach integrates physical movement with intellectual activity and the use of all senses, which is believed to improve cognitive processes and deeper learning. SAVI is an acronym for four main components of learning, namely, somatic, meaning learning by moving and doing, auditory, meaning learning by speaking and listening, visual, meaning learning to observe and describe, intellectual, meaning learning by solving problems.

The SAVI model emphasizes that optimal learning occurs when these four components are integrated into one learning event. This approach aims to accommodate various learning styles of students and create a comprehensive and meaningful learning experience. This can be proven by previous research conducted by (Silvana & Supriadie, 2017) [23] that SAVI learning is learning that involves all senses in the body that support the learning process. Based on the problems above, the researcher has hopes and desires that students will get improved learning outcomes. Therefore, if these hopes and desires are achieved, the researcher will conduct research on the influence of PBL and SAVI learning model strategies on the main discussion of plant reproduction systems on the learning outcomes of students in class IX of SMP Negeri 6 Tondano.

Method

This type of research is experimental research, which is categorized as a quasi-experiment. This research was conducted twice, namely before and after treatment was given. X1 and X2 and are assessments carried out before (pretest) treatment is given while Y3 and Y4 are assessments carried out after or after (posttest) treatment is given. This research was conducted at SMP Negeri 6 Tondano, East Tondano District, Minahasa Regency, North Sulawesi Province with coordinates 1 ° 18' 06. 8 "N 124 ° 54'45. 7" E, in the odd semester of 2024/2025.

The population in this study were all students at SMP Negeri 6 Tondano which consisted of 4 classes. Sampling for this study used a random sampling technique. This technique is carried out by placing all class names consisting of 4 classes into one container and then taken randomly, as a research sample is class IX which consists of 2 classes. In this study, the use of instruments to measure student learning outcomes each used a written test instrument in the form of multiple-choice questions of 35 items that were tested for validation and reliability and produced 30 multiple-choice questions that were valid and reliable and arranged based on their indicators. This instrument was given to students during the pretest activity, namely before treatment and posttest activities, namely after treatment. Before being given to students, the instrument must be tested through validity and reliability tests. Testing the validity of the question items using the SPSS for Windows 23 program. The testing techniques were reliability tests, validity tests, difficulty level tests and discriminatory power tests.

The data collection technique in the study was pre-experiment: observation and permission and interviews. The implementation of the experiment consisted of three stages, namely: 1) The experimental class and control class were first given a pretest before the start of the treatment or entering the learning material. 2) Carrying out treatment by applying the PBL learning model strategy, SAVI, PBL interaction and SAVI in the experimental class and the conventional learning model in the control class. 3) After the learning activities ended, the experimental class and the control class were given a posttest. The data analysis technique was a one-way ANOVA hypothesis test to measure each effect of using the PBL and SAVI learning model strategies on student learning outcomes. Before testing the hypothesis, a prerequisite test must be carried out, namely the normality test and the homogeneity test. The use of this test is assisted by SPSS 23 for Windows software.

Results and Discussion

Results

1. Data on the Implementation of Learning Syntax

Data on the implementation of the learning syntax of this study were obtained from filling out the observation sheet by the science subject teacher on the material of the growth and reproduction system towards the learning activity process in the classroom. The results obtained in the implementation of syntax will be explained as follows:

a. PBL Syntax

The implementation of syntax in PBL, namely problem orientation, organizing, guiding, presenting results, and

analyzing, reached a result of 85.93%, indicating that the syntax has been implemented effectively and efficiently in improving student learning outcomes. PBL syntax is orientation, organizing, guiding, presenting results, and evaluation.

b. SAVI Syntax

The implementation of syntax in SAVI, namely preparation, delivery, training, and presentation of results, reached a result of 82.81% with very good criteria, indicating that the syntax has been implemented effectively and efficiently in improving student learning outcomes. SAVI syntax is preparation, delivery, training and presentation of results.

c. PBL and SAVI Syntax

The implementation of the syntax in PBL and SAVI, namely problem orientation, organizing, guiding, presenting results, and analyzing, achieved a result of 89.06, which indicates that the syntax has been implemented effectively and efficiently in improving student learning outcomes. The syntax obtained is orientation, organizing, guiding, presenting results, and evaluation.

2. Instrument Testing Results

The measurement of learning outcomes uses a test instrument that has previously been tested for validation and reliability using SPSS 23 for Windows, which is described as follows:

a. Validation Test Results

Instrument validity testing can be done by correlating each question item with the total score. All 30 question items are declared valid with a sig. <0.05.

b. Reliability Test Results

Based on the validity of the questions that have been obtained, the next test is the reliability test. All test items are reliable with a Cronbach's Alpha Based on Standardized Items value of 0.938. These results include test reliability in the high category with a value range of $0.6 < r \leq 0.9$.

c. Difficulty Level Test Results

The results of the difficulty level test show that the difficulty index of the questions varies. The results of the difficulty level test on the instrument have a level of difficulty of questions in the difficult category totaling 7 questions and a level of difficulty in the medium category totaling 23 questions.

d. Differential Power Test Results

The results of the differential power test show that those stated to have very good differential power are 5 questions, namely with a differential power index between the range of 0.70-1.00. While those stated to have good differential power are 24 questions, namely with a differential power index between the range of 0.40-0.69.

3. Learning Outcome Data

Learning outcome data is obtained from the pretest and posttest scores in each class. The average results of the pretest and posttest scores in each class showed an increase in each class. The increase in the PBL class was 86%, the SAVI class was 82%, the PBL and SAVI classes were 89%, and the control class was 63%. The highest increase was in the PBL and SAVI classes, which was 89%, and the class with the lowest increase was in the control class with an increase of 63%.

4. Prerequisite Test Results

a. Normality Test

The results of the normality test on the pretest and posttest data of student learning outcomes. Decision making in this normality test is based on the sig. value > 0.05 which states that the data is normally distributed.

b. Homogeneity Test

The results of the homogeneity test on the pretest and posttest data of student learning outcomes. Decision making in this homogeneity test is based on the sig. value > 0.05 which states that the data is normally distributed.

5. Hypothesis Test

The hypothesis testing of learning outcomes was carried out using the ANOVA test analysis. there is a significant difference in learning outcomes in classes taught by PBL, SAVI, PBL and SAVI interaction models with a sig. value of 0.000 <0.05. These results provide information that the use of learning models in each class has a real influence on improving learning outcomes. Then to find out the use of learning models that have the most influence on student learning outcomes, further testing was carried out. The use of PBL, SAVI, PBL and SAVI interaction learning models is significantly different from conventional learning models on student learning outcomes as seen based on the LSD notation value. In addition, PBL and SAVI interactions have the highest corrected average value of 84.36 with an increase of 89%.

Discussion

1. The Effect of PBL Strategy on Learning Outcomes

Based on the results of the research that has been conducted, there has been an increase in learning outcomes in the PBL class. The success of using the PBL learning model in improving student learning outcomes is certainly inseparable from a series of syntaxes that are able to provide good thinking stimuli in the learning process in the classroom. This can be seen in the first syntax, namely orientation, where in this syntax students are directed to listen, observe, record and search for information, and formulate a problem regarding natural vegetative propagation. The problems given can train students in carrying out problem-solving habits that affect the intended abilities, for example, accustoming students to think creatively by exploring and putting forward ideas, and identifying problem solving that can be applied to solve the problems given (Paat *et al*., 2021) [17].

In the second syntax, namely organizing and identifying, where students are divided into small groups consisting of 3-5 people. Together with their respective groups collaborating in exploring and solving complex problems, students share their ideas and experiences, stimulate creative thinking and improve their ability to expand, detail, and develop deep ideas in this collaborative environment. This is in line with research (Herdiawan *et al*., 2019) [10] which states that PBL syntax that can train elaboration indicators is organizing students to learn, where this syntax proposes various approaches to problem solving by collecting information from various sources. Furthermore, conducting a literacy study to collect information or look for references

to formulate a problem that they have noted and answer questions based on the article. This syntax encourages collaboration between students and their group members to jointly investigate problems. Students take responsibility independently for this learning by placing some of the information they need to solve the problem. In line with the opinion of (Paat *et al*., 2023) [19] that in PBL students will be involved in solving problems, so that they will apply the knowledge they have or seek the knowledge they need.

The third syntax is guidance and discussion. In this syntax, students are guided by teachers to get the direction and support needed for students in their investigation process, this includes providing guidance on relevant resources, research techniques, and problem-solving strategies. Supported by research by (Utamo *et al*., 2020) that students can explore topics in depth, present more detailed arguments, and refine their ideas with further collaboration. In this syntax, students are directed to collect information about the problems that arise and foster student independence and responsibility. Strengthened by (Paat, Mokalu, & Sutopo, 2024) [18] that PBL requires students to take an active role in their learning, students become more responsible for their own learning process and outcomes. The involvement of students in this discussion is able to provide an overview of the improvement of ethical aspects supported by moral reasoning.

The fourth syntax, namely the presentation of results, where students analyze and develop the results of their identification together with their group. During this stage, students are encouraged to hone their ideas into more detailed and innovative solutions, and broaden their thinking. In line with research conducted by (Nafizatunni'am *et al*., 2024) [14] which states that when presenting solutions to groups, students have the opportunity to show and listen to their original ideas to others who can enrich the ideas produced and encourage new perspectives. This is in line with research by (Nurtamara *et al*., 2020) which states that this activity involves collaboration for the negotiation process and evaluation of understanding to construct knowledge in more depth. Thus, the resulting decision-making process is truly appropriate and effective to be applied in real life. Furthermore, research by (Lelamula, Sasinggala, & Paat, 2022) [17] that the learning process using the PBL model requires students to think critically, find, and analyze the problems they find according to the experiences and realities they see in everyday life.

The fifth syntax is evaluating. Students reflect or analyze and evaluate the results of the group work answers of students on the process and results of the investigations they have carried out and write down the solutions they offer to overcome obstacles or problems that arise during the natural vegetative propagation process. In line with research (Hariyanti & Fitriasih, 2024) [9] which states that in this syntax, the activities of students and teachers evaluate the results of discussions and presentations that have been carried out by choosing the right solution and also ending with concluding the learning outcomes from this can hone students' thinking according to their opinions. In this syntax, students can also formulate the solutions they offer that are effective, and mention the advantages and disadvantages of the solutions they provide.

Through this syntax, PBL is able to have a positive influence on improving students' ability to solve problems. In addition, problem solving must be possessed by students in everyday life because everyone is always faced with various problems that must be solved and require creativity in order to be able to find solutions to the problems they face, then encourage students to think critically. In line with (Paat, Tumbel, & Mokalu, 2022) [19] that in the PBL model, students not only understand the basic concepts and their applications related to the problems that are the basis of reference, but also receive learning experiences from problems found and identified by students related to the skills of applying and utilizing scientific methods in problem solving and being able to develop critical thinking patterns.

2. The Influence of SAVI Strategy on Learning Outcomes

Based on the results of the research that has been conducted, there is an increase in learning outcomes in the SAVI class. The application of the SAVI learning model makes students experience a series of processes that support the achievement of learning outcome indicators that are able to provide good intellectual stimulation in the learning process in the classroom.

The first syntax, namely the preparation stage. at this stage the teacher conducts orientation, the advantages of this learning are training to develop in mastery of skills, training students in obtaining knowledge individually, and raising motivation and enthusiasm for learning in students to be more active in learning. So that teachers can guide students to think about solving problems. In addition, the teacher also explains to students about the concepts or materials being studied, the aim is that the learning outcomes to be achieved increase and students get motivation by being given an explanation of the benefits of the material being studied. This is in line with the opinion of (Asniwati *et al*., 2018) [3] that learning that is presented in an interesting and challenging way can encourage students to be active in analyzing and identifying information, and thinking concretely.

In this syntax, the teacher guides students through learning steps that aim to create a conducive learning atmosphere so that students are more motivated to learn. In line with the opinion of (Sardiman, 2020) [22] that strong motivation in learning greatly affects learning outcomes because strong learning motivation can cause students to have a lot of energy to carry out the learning process. The teacher explains the learning topic, the objectives to be achieved, and the learning outcomes that are expected to be achieved by students. This is in line with the results of research (Ashri, 2020) which states that the application of the SAVI learning model has a significant effect on learning outcomes because students feel comfortable and avoid boredom if the teaching and learning process is carried out differently, namely not only with the lecture method,

The second syntax, namely the delivery stage, at this stage, students are divided into small groups consisting of 3-5 people (Somatic). This step has advantages over previous learning because it provides opportunities for students to be active in group discussions. The goal is for students to be trained to interact and work together with other students so as to improve their collaboration skills and communication skills. In line with the opinion of (Nandita *et al*., 2025) [15] that collaborative skills in group learning are a collection of student abilities that are components of collaboration in

cooperative activities to achieve the same goals in which there is equality, sharing tasks, responsibilities and fostering togetherness and finding solutions together.

In this syntax, students are trained to be able to carry out discussions, ask questions actively, solve problems related to the material being studied, so that there is good interaction between teachers and students in the learning process. Active student involvement is needed because it can create new knowledge for students in each learning process. Students are directed by the teacher to explore information from the material being studied together with their group. Through this activity carried out in the learning process by applying the SAVI model, students improve their creative thinking skills.

This is in line with the opinion of (Akbar *et al*., 2020) that the implications of this study can increase student activity, be able to solve problems, and develop students' creative thinking skills. The teacher has prepared a learning link so that students get the knowledge or materials that students need for the training stage and the performance stage and answer the questions that have been prepared, at this stage assisted by the recording results to carry out identification activities (Auditory, Visual, Intellectual). This syntax encourages collaboration between students and their groups to jointly investigate problems (Somatic, Auditory, Intellectual). Stimulation to think plays a role in identification activities to describe, relate and consider problem investigations (intellectual).

The third syntax, namely training, at this stage students conduct investigations based on student worksheets given by the teacher regarding artificial vegetative propagation. The learning process carried out is that students make observations in analyzing artificial vegetative propagation. In this syntax, students are empowered as active subjects in the learning process, where they are invited to participate through exploration, discussion, and problem solving. Interactive activities such as direct experiments, group discussions, and collaborative projects are key to directly involving students, which not only facilitate conceptual understanding but also improve their social and collaborative skills. In line with (Sophian *et al*., 2025) [24] that when students are involved in concrete and relevant learning experiences, they are better able to link theory with practice, which in turn strengthens their motivation and interest in the material being taught. Based on the results of observations and discussions, students can obtain additional information to explain the process of artificial vegetative propagation. In addition, students can also appreciate the opinions of friends who are one of the indicators of affective attitudes, such as making observations according to procedures and drawing conclusions based on the results obtained.

The fourth syntax is the presentation of results, at this stage, students present (auditory) the results of the practicum and group discussions. This stage can foster students' self-confidence to present the results of the discussion and foster an attitude of awareness of the environment. Students are required to be able to capture the relationship between the learning process they get at school and real life. Students are expected to be more familiar with good communication skills by requiring them to be able to communicate what they have learned in their respective groups. After that, students make conclusions from what they have learned and what has been discussed in groups (visual). According to (Carito *et al*., 2013) that the SAVI learning model has been proven to effectively improve the communication skills needed as well as student activities, which initially students were less brave in expressing opinions to become braver and more actively involved in learning. The stage where students together with small groups present in front of their class about the results they obtained then other groups listen and pay attention to the group that is presenting the findings they have obtained, then other groups ask questions.

The application of the SAVI learning model is effective in improving student learning outcomes because the SAVI learning model can make students in learning activities that combine four learning styles in the learning process. This is in line with research by (Baden, Sutsnawari & Maulana, 2023) [4] showing that the application of the SAVI learning model has proven effective in improving student learning outcomes, especially in science subjects. The results of this study indicate that students who use the SAVI approach have a better understanding of concepts compared to those who learn with traditional methods. In addition, research by (Febriana, Suriansyah, & Purwanti, (2023) found that the SAVI learning model also contributes to improving students' critical thinking skills, in the study, students who learned with the SAVI method showed better test results in problem solving and conceptual understanding, compared to students who used the traditional approach.

3. The Influence of PBL and SAVI Strategies on Learning Outcomes

Based on the results of the research that has been conducted, there is an increase in learning outcomes in the PBL and SAVI classes. The success of using the PBL and SAVI learning models in improving student learning outcomes is certainly inseparable from a series of syntaxes that are able to provide good thinking stimulation in the ongoing learning process. This can be seen in the first syntax, namely problem orientation and the training stage. At this stage, the teacher explains the learning objectives, explains the logistics needed, motivates students to be actively involved in the ongoing learning activities. In addition to delivering the material, this stage also explains the problems that will be solved by students. Furthermore, students listen, observe, take notes and write down the problem formulation based on the results of the identification through learning videos that have been presented by the teacher individually (Visual, Auditory).

In line with research by (Pratiwi, 2022) [20] that the results of the study show that the PBL learning model with the help of audio-visual learning media is effective in improving student learning outcomes and critical thinking skills, the results of observations show an increase in critical thinking skills in each cycle. Then students are directed to search for literature on the formulation of the problem that has been written for information search and to facilitate the analysis of unique information and facts as a general description and basis for consideration later before carrying out more in-depth identification activities together with the group. In line with research (Rizkia *et al*., 2016) states that this syntax encourages collaboration between students and their group members to jointly investigate problems. Furthermore, research by (Paat *et al*., 2018) [17] states that in PBL situations, students integrate knowledge and skills simultaneously and apply them in relevant contexts. This means that what they learn is related to real situations, not

just theoretical, so that problems that arise in applying a concept or theory can be encountered and resolved during the learning process.

The second syntax is organizing and delivering. Students are divided into small groups of 3-5 people with the aim of overcoming the lack of interaction and cooperation between students or the lack of participation in the learning process. Together with their respective groups collaborating in exploring and solving complex problems, students share their ideas and experiences, stimulate creative thinking and improve their ability to expand, detail, and develop deep ideas (Auditory, visual, intellectual). Students will be actively involved in solving problems, so that they will apply the knowledge they have or seek the knowledge needed, in other words, learning occurs in the context of applying concepts. In line with research by (Kembuan, Tumbel & Paat, 2019) [12] that this can make learning more meaningful and can be improved when students are faced with conditions where concepts can be applied through practice. Then the teacher encourages students to collect appropriate information to get problem solving and explanations. Students record their observations and exchange opinions in discussions and find solutions to the problems given.

In this syntax, students focus and are active in solving problems and making decisions through discussion. Encouraging students to gather information is a process that must continue to take place where students are involved in sharing information, solving problems and making decisions through discussion. In line with (Fikri *et al*., 2021) [8] that group discussion has the meaning of a strategy that involves students to think together with the group to solve problems. With this activity, students are actively involved in the learning process and are enthusiastic about looking for information both on the internet and in books or other learning sources.

The third syntax is guiding and training, in this syntax, students are guided by the teacher to discuss between groups to communicate with each other and conduct training on problems that have been found. In this syntax, students integrate and absorb new knowledge and skills in various ways. Then the SAVI principle will be empowered. In the somatic principle, it is presented in the form of experimental activities related to learning materials, in line with the opinion (Wiraputra, Suastra, & Sudiana, 2023) [26] that the use of somatic learning can strengthen scientific concepts through direct observation that makes students understand the material being studied. In addition, students are given the opportunity to do group work with their friends in making observations and making observation results.

The auditory principle is presented in listening and speaking activities, where students can ask things that are not yet known from the explanations that have been given by the teacher. The visual principle is presented in observing, describing, demonstrating, reading. Where students are invited to make direct observations of the problems they get. Students use their visuals to learn more easily if they can see what someone is talking about. The intellectual principle can learn by solving problems and thinking meaningfully that learning must use thinking skills, then students' actions do something with their minds internally when using intelligence to connect an experience they get and create relationships, meanings, plans, and values of that experience. In line with the opinion (Lestari, 2020) that SAVI learning has an impact on skills, especially on collaboration and communication skills, which has an impact on increasing students' enthusiasm for learning.

The fourth syntax is, presentation of results and appearance of results, in this syntax, the teacher calls one group at a time to present the report of the results of the discussion. In this syntax, it can overcome one-way learning that only receives information without analyzing or questioning the question and answer method, it can maximize active participation and communication of students in the classroom. In accordance with the opinion of (Prijanto *et al*., 2021) that this syntax can help increase student activity in learning so that students can be actively involved in learning. In addition, in this syntax, students get a lot of practice and communicate the results of good group discussions in a way that can be understood by the group. Thus, learning with problem-based methods can improve students' communication skills and learning outcomes can be further improved.

In line with research conducted by (Paat *et al*., 2023) [18] that PBL can improve student learning outcomes, this is because in the PBL learning process students are required to think critically, find, and analyze the problems they find according to the experiences and realities they see in everyday life. Students provide a variety of their findings for the development of work so that somatic is empowered, then facilitate group discussions and presentations of their findings. The existence of student group discussions is directed to encourage cooperation, be responsible for dividing tasks, this is in line with gradually auditory encouraging the use of visual elements in visually developed works and providing reflective questions that encourage intellectual deep thinking. In line with the opinion of (Dewi & Negara, 2020) [6] that learning can improve students' intelligence in full because of the combination of physical movement with intellectual activities, creating a fun, interesting, effective, and innovative learning atmosphere, arousing creativity and increasing students' psychomotor skills and maximizing the sharpness of students' concentration through visual learning.

The fifth syntax is to analyze and evaluate. Students evaluate the process and results of the investigations they have carried out and write down actions as a description of the results of the decisions made. The teacher provides an explanation, students are given the opportunity to actively participate in the learning process, they can ask questions, discuss, interact with the teacher. This is in line with the opinion of (Purwanti *et al*., 2019) that learning will be more meaningful if students are given the opportunity to participate in various learning activities, both inside and outside the classroom so that they can actualize their abilities more comprehensively. Then students are directed to make learning conclusions together. Auditory, visual, intellectual play a role in listening, speaking, seeing, and analyzing as well as comparing and evaluating several possible problem solutions and are able to reflect and evaluate the thinking process, decision making in an integrated manner, resulting in a deeper understanding of concepts and better metacognitive skills.

In this syntax, the teacher invites students to conclude the learning by asking questions if there is something that is not understood, then summarizing the students' answers and providing input, explanations and reinforcement. In this syntax too, students can also formulate suggestions to

support the implementation of the most effective solutions as an evaluation of problem solving. This is in line with research conducted by (Lelamula, Sasinggala & Paat, p. 25, 2020) [13] which states that PBL can improve student learning outcomes, this is because the learning process using the PBL model requires students to think critically and find and analyze the problems they encounter according to their experiences and the realities they see in everyday life.

The combined use of PBL and SAVI has succeeded in improving student learning outcomes, making lessons more meaningful and enjoyable, involving students more actively in learning, and creating two-way learning between teachers and students, where teachers and students reflect on each other so that learning activities continue to increase. In line with the opinion of (Jatmiko *et al*., 2022) [11] that teacher reflection on their professional practices, especially on learning and teaching, is an important factor in the emergence of innovation and revolution in classroom learning. In addition, reflection is an important tool to expand and deepen teachers' professional knowledge.

The SAVI learning model makes students actively involved, because it involves various senses in learning and can meet the needs of students' learning styles that are not only listening, through combining physical movement with intellectual activities, so that students do not get bored quickly, increasing students' enthusiasm in participating in learning. In line with the opinion of (Nurak *et al*., 2022) [16] that the characteristics in the SAVI learning model already represent all student activities in learning activities, because students not only gain knowledge but can really understand and experience directly what is being learned. Furthermore, students are more trained in integrating various learning methods to understand concepts. For learning motivation, PBL increases motivation through real-world problem-solving challenges, learning through SAVI can increase motivation with a fun learning approach that involves all the senses.

Conclusion

1. PBL has been proven to improve student learning outcomes through five structured syntaxes, starting from problem identification, group work, guidance, to presentation and evaluation. This process encourages understanding of critical thinking concepts and active problem solving. In addition, PBL fosters individual responsibility and collaboration in facing real challenges.
2. SAVI learning improves student learning outcomes through four integrated syntaxes, where in the preparation, delivery, training, and presentation stages. Each stage combines SAVI learning styles in a balanced way, this process encourages communication, creativity, critical thinking, and student confidence and creates active and contextual learning experiences that are relevant to the real world.
3. The interaction of PBL and SAVI has been proven to improve student learning outcomes. The combination not only strengthens conceptual understanding, but also develops critical thinking skills, communication, problem solving, and the relevance of learning to real life. PBL and SAVI create more comprehensive, enjoyable, and meaningful learning. Student-centered learning, especially involving problem solving and the activation of various learning modalities, can significantly improve learning outcomes compared to conventional learning.

Reference

1. Afifah SN, Septi BS. Efektivitas Model Pembelajaran SAVI dalam Mata Pelajaran IPA di Kelas VSD. Elementar: Jurnal Pendidikan Dasar,2022:2(2):211–219.
2. Asbar RF, Marta R, Fadhilaturrahmi F. Peningkatan Keterampilan Proses Sains Dengan Menggunakan Model Somatic Auditory Visual Intelectual (SAVI) Di Sekolah Dasar. Al-Madrasah: Jurnal Ilmiah Pendidikan Madrasah Ibtidaiyah,2023:7(1):52–63.
3. Asniwati, Fauzi ZA, Fikri H. Improving Learning Activities Using a Combination of Mind Mapping Model, Think Pair Share and Teams Game Tournament. ATLANTIS PRESS: Advances in Social Science, Education and Humanities Research,2018:274:318–322.
4. Baden B, Sutisnawati A, Maulana L H. Model Pembelajaran Inkuiri Untuk Meningkatkan Pemahaman Mata Pelajaran IPA Siswa Kelas VI Sekolah Dasar. Jurnal Educatio FKIP UNMA,2023:9(3):1340–1347.
5. Cantona IGE, Sudarma IK. Model Pembelajaran SAVI Berbantuan Media Mind Mapping Meningkatkan Hasil Belajar IPA Peserta didik Kelas V. Jurnal Pedagogi Dan Pembelajaran,2020:3(2):269–279.
6. Dewi ATYR, Negara IGAO. Pengaruh Model Pembelajaran (SAVI) Berbantuan Multimedia Terhadap Kompetensi Pengetahuan IPA. MIMBAR PGSD Undiksha,2020:8(1):40–49.
7. Febrina N, Suriansyah A, Purwanti R. Model Pembelajaran Protection Landing Meningkatkan Keterampilan Berpikir Kreatif Siswa SD Muatan IPA. Journal on Teacher Education,2023:5(1):146–158.
8. Fikri A, Nurona A, Saadah L, Nailufa LE, Ismah V. Keterampilan Guru Dalam Membimbing Diskusi Pada Pembelajaran Abad 21. Tanjak: Journal of Education and Teaching,2021:2(1):1–7.
9. Hariyanti D, Utomo A P, Fitriasih W. Penerapan Problem Based Learning Berbantuan Media Puzzle untuk Mewujudkan Karakter Profil Pelajar Pancasila pada Siswa Kelas X-4 SMAN Pakusari. Jurnal Teknologi Pendidikan,2024:1(4):10.
10. Herdiawan H, Langisari I, Solfarina S. Penerapan PBL untuk meningkatkan keterampilan berpikir kreatif siswa pada konsep koloid. Educhemia (Jurnal Kimia dan Pendidikan),2019:4(1):24.
11. Jatmiko HTP, Putra RS. Refleksi Diri Guru Bahasa Indonesia dalam Pembelajaran Berdiferensiasi di Sekolah Penggerak. Lingua Franca: Jurnal Bahasa, Sastra, dan Pengajarannya,2022:6(2):224–232.
12. Kembuan G, Tumbel F, Paat M. Development of problem based learning based student worksheets to improve student learning outcomes in Poigar 1 public middle school. Development, 2019, 4(5).
13. Lelamula MD, Sasinggala M, Paat M. Pengaruh Model Pembelajaran Problem Based Learning Dengan Media Berbasis Power Point di Masa Pandemi Covid 19 terhadap Hasil Belajar Siswa Pada Pembelajaran IPA Biologi di SMP. SCIENING: Science Learning Journal,2022:3(1):22–27.
14. Nafizatunni'am N, Sukarso A, Lestari T A, Jamaluddin. Pengaruh Model Problem Based Learning Terhadap

Keterampilan Berpikir Kreatif Dan Hasil Belajar Biologi Siswa. Journal of Classroom Action Research,2024:6(3):494–503.
15. Nandita NSS, Chan FC, Sherly ISP. Penerapan Model Pembelajaran Kooperatif Group Investigation untuk Meningkatkan Keterampilan Kolaborasi Peserta Didik pada Pelajaran IPAS Materi Melihat Karena Cahaya Mendengar Karena Bunyi Kelas V SDN 17/I RANTAU PURI. Pendas: Jurnal Ilmiah Pendidikan Dasar,2025:10(1):231–244.
16. Nurak Y, Helvina M, Yufrinalis M. Pengaruh Model Pembelajaran SAVI Terhadap Hasil Belajar Siswa pada Mata Pelajaran IPA Materi Gaya Kelas IV di SD Katolik 083 Wairpelit. Journal Nagalalang Primary Education, 2022, 4(1).
17. Paat M, Kawuwung FR, Mokalu YB. Penerapan LKS model pembelajaran berbasis masalah untuk meningkatkan kemampuan berpikir tingkat tinggi SMPN 5 Tondano. JISIP (Jurnal Ilmu Sosial dan Pendidikan), 2021, 5(2).
18. Paat M, Mokalu Y B, Hadi Sutopo M M S I. Integrasi Artificial Intelligence dalam Problem-Based Learning: Pendekatan Praktis. Topazart, 2024.
19. Paat M, Tumbel F M, Mokalu Y B. Pengembangan Media Pembelajaran Bentuk Lagu Dengan Menggunakan Model PBL Pada Materi Klasifikasi Makhluk Hidup Di SMA Negeri 1 Motoling. SOSCIED,2022:5(2):287–295.
20. Pratiwi I. Penerapan Model Problem Based Learning Berbantuan Audio Visual Untuk Meningkatkan Kemampuan Berpikir Kritis dan Hasil Belajar Siswa. Journal of Education Action Research, 2022, 6(3).
21. Redhana I W. Mengembangkan Keterampilan Abad Ke-21 Dalam Pembelajaran Kimia. Jurnal Inovasi Pendidikan Kimia,2019:13(1):2239–2253.
22. Sardiman. Interaksi & motivasi belajar mengajar. PT Raja Grafindo Persada, 2020.
23. Silvana H, Supriadie D. Efektivitas Penerapan Model Pembelajaran Somatic, Auditory, Visualization, Intellectually (SAVI) Terhadap Peningkatan Kemampuan Berpikir Kritis Peserta didik Pada Mata Pelajaran IPA. Educational Technologia, 2017, 1(2).
24. Sophian SK, Hidayah RR, Fia A, Safitri D, Suryanda A. Model Pembelajaran SAVI (Somatic, Auditory, Visualization, dan Intellectually) untuk Meningkatkan Hasil Belajar Siswa. DIAJAR: Jurnal Pendidikan dan Pembelajaran,2025:4(1):1–7.
25. Tampinongkol NN, Paat M, Lihiang A. Pengembangan Media Audio Visual dengan Model Problem Based Learning (PBL) Berbasis Kearifan Lokal Sulawesi Utara pada Pembelajaran Biologi di SMA. JSPB BIOEDUSAINS,2022:3(2):136–143.
26. Wiraputra IPFA, Suastra IW, Sudiana IN. Dampak Positif Model Pembelajaran SAVI Berbantuan Mind Mapping Terhadap Literasi Sains dan Hasil Belajar IPA. Jurnal Ilmiah Pendidikan dan Pembelajaran,2023:7(1):124–133.