

# OPTIMIZATION OF PROBLEM-SOLVING SKILLS THROUGH THE APPLICATION OF CREATIVE PROBLEM-SOLVING MODELS ASSISTED BY ACCOUNTING CARDS

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## ABSTRACT

According to the national education paradigm of the 21st century, the goal of accounting learning emphasizes the ownership of skills needed in the 21st century, including problem-solving skills. The Creative Problem Solving (CPS) learning model was chosen to improve learners' ability to solve a problem with structured steps so that learners will be accustomed to honing problem-solving skills. This is a classroom action research carried out in two cycles: planning, action, observation, and reflection. The research subjects were 33 students of class X Accounting 3 SMK N 3 Surakarta. The data collection techniques are tests, observations, interviews, and documentation. Techniques for testing the validity of data using source triangulation. The results showed an increase in problem-solving ability from the medium category in first cycle to the high category in second cycle.

Keywords: Learning Model; Creative Problem Solving; Working Card; Problem Solving Ability

## ABSTRAK

Tujuan pembelajaran akuntansi menurut paradigma pendidikan nasional abad 21 menekankan pada kepemilikan keterampilan yang dibutuhkan pada abad 21, diantaranya kemampuan memecahkan masalah. Model pembelajaran Creative Problem Solving (CPS) dipilih untuk meningkatkan kemampuan peserta didik dalam menyelesaikan suatu masalah dengan langkah-langkah yang terstruktur, sehingga peserta didik akan terbiasa untuk mengasah keterampilan pemecahan masalah. Penelitian ini merupakan penelitian tindakan kelas (PTK) yang dilaksanakan dua siklus dengan tiap siklus terdiri dari perencanaan, tindakan, observasi dan refleksi. Subjek penelitian adalah 33 peserta didik kelas X Akuntansi 3 SMK N 3 Surakarta. Teknik pengumpulan data yang digunakan adalah tes, observasi, wawancara dan dokumentasi. Teknik untuk menguji keabsahan data menggunakan triangulasi sumber. Hasil penelitian menunjukkan terdapat peningkatan kemampuan pemecahan masalah dari kategori sedang pada siklus pertama meningkat menjadi kategori tinggi pada siklus kedua.

Kata Kunci : Model Pembelajaran; Creative Problem Solving; Kartu Akuntansi; Kemampuan Pemecahan Masalah

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## INTRODUCTION

The education system has undergone some significant changes. As evidenced by Singh (2018), every 5.5 years, scientific knowledge is growing and multiplying and demands adjustment for everyone related to the knowledge and skills that learners need to be able to face the needs of such significant changes. One of the skills needed by learners is problem-solving skills. Problem solving is inevitable in human life and is essential for human survival. This is why problem-solving skills are a vital competency in 21st-century competencies (Al Mallak, 2020). Changing the paradigm of the 21st century, students are required to be more responsible in building an understanding of knowledge based on their needs. The ability to solve problems is learning facts, concepts, principles of calculation, realization and prioritizing procedures, and strategic steps taken in solving problems in learning (As-salam et al., 2018).

Based on the results of interviews with teachers in the field of study, information was obtained that students' problem-solving abilities still have to be improved. Students lack independent study and are passive when the teacher gives questions. Students are still doing the questions according to the teacher's instructions or sequence, even though they can do it in other ways or methods. As a result, students' creativity is still not honed, and they will find it challenging to recognize and identify the problems given by the teacher. This is also supported by the initial test results, which showed that 57.58% (19 students) had a low problem-solving ability, and 42.42% (14 students) had good problem-solving skills. The average score obtained by students is 58.71 (low category) or below. Based on the observations, another actor who is the cause of low problem-solving ability is the learning model that the teacher has applied is teacher center learning.

In order to overcome these gaps, appropriate applicative solutions are needed to improve problem-solving skills, namely the application of the Creative Problem-Solving learning model with the help of accounting work cards. The Creative Problem-Solving learning model directs students' thinking to develop divergently because it seeks to achieve various alternative solutions. The problem must be creative and use many strategies, and the final answer is not singular (Lewis, Knoblich, & Poe, 2018). The Creative Problem Solving (CPS) model focuses on teaching and problem-solving skills, followed by strengthening skills. When faced with a problem, students can perform problem-solving skills to choose and develop their ideas and thoughts. Learners not only use the way of memorization without a thought process but use problem-solving skills that develop thought processes (Pepkin, 2014). Murwaningsih & Fauziah (2022) describes CPS as a model of thinking skills whose function is to improve the thinking process to overcome difficulties better. This is in line with the results of research from several experts who state that the Creative Problem-Solving learning model has been proven that the learning model can improve problem-solving skills (Sabban & Hayun, 2018; Udiyah & Pujiastutik, 2017).

In this study, the CPS learning model was applied with the help of an accounting work card as the learning media. Sanjaya (2013) said that learning media is necessary to send learning materials to students to achieve learning goals. Accounting work cards have several functions, including attracting students' attention when playing games, concentrating, and trying to understand the material presented in the Accounting Card. In addition, when playing the accounting work card, it is expected that students will feel exciting and comfortable when studying the material. The hope is that it can increase the level of enjoyment of students when studying the material. The cognitive function of the accounting work card is to accelerate students'



understanding of the material presented by the teacher using the accounting work card.

Based on the explanation above, this study aims to improve the problem-solving ability of class X Accounting 3 students of SMKN 1 Surakarta by applying a Creative Problem-Solving learning model assisted by accounting work cards. The novelty of this study lies in the use of the Creative Problem-Solving learning model combined with work card learning media applied to banking accounting learning and facilitated students to find effective ways to solve problems.

## METHOD

This is a class action research developed by Stephen Kemmis and Robbin Mc Taggart (1988). This research was carried out in two cycles: planning, action, observation, and reflection. Each cycle is carried out in 3 meetings each and ends with a problem-solving ability test. Data sources come from teachers and learners. The data collection method is primary in the form of interviews of students and teachers, tests of students' problem-solving abilities, and observations of teacher performance in teaching and learning activities. The subjects in this study were students of class X Accounting 3 SMKN 1 Surakarta.

The step in applying this learning model refers to the syntax of the Creative Problem Solving learning model, according to Pepkin (2014), which consists of problem clarification, disclosure of ideas, evaluation and selection, and implementation. In the first stage, namely the clarification of the problem, the teacher explains the theme or problems proposed. This is so that students can understand how to solve the problem. The second stage is opinion-sharing. At this stage, learners can express opinions on a wide variety of problem-solving strategies. Stage 3 is evaluation and selection. Each group discusses which opinions or strategies are suitable for solving the problem. Stage 4 is implementation. The learner determines which strategies can be taken to solve the problem and then applies them until it finds a solution. The accounting work card is used as a teacher's intermediary tool to convey cases of problems that students must solve. The accounting work card media is attractively packaged so that students are more interested in participating in learning. The work card will be printed in a size of 12 cm x 7 cm. Each group will get five cards, each containing different problems. The timing of giving this accounting work card will be adjusted to the steps of the Creative Problem Solving learning model.

Data analysis in this study used an interactive model for qualitative data in the form of interviews and comparative descriptive statistics for quantitative data in observation and test results. Analysis of quantitative data on observation instruments aims to determine teachers' performance by applying the Creative Problem Solving learning model assisted by accounting work cards. In contrast, the test instrument aims to find out the ability of students to do problem-solving questions and compare these abilities before being given action and after. The assessment of each indicator of the learner's ability to solve problems refers to the rubric of the assessment of problem-solving ability shown in Table 1.

**Table 1. Problem Solving Ability Assessment Rubric**

Assessed Aspects	Score	Information
Understanding the issue	0	It does not mention what is known and what is asked.
	1	Mentioning what is known without mentioning what is asked or vice versa
	2	Mentioning what is known and what is asked but not

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Assessed Aspects	Score	Information
Plan for completion	3	quite right
	0	Mentioning what is known and what is asked exactly
	0	Not Planning a settlement at all
	1	Plan a settlement by choosing a settlement method to use but not quite right
	2	Plan a settlement by choosing a settlement method to be used appropriately
Executing the plan	0	No answer at all
	1	Carry out the plan by writing down the answers, but the answers are incorrect.
	2	Carry out the plan by writing down the answers to half or most of the correct answers
	3	Carry out the plan by writing down the answers entirely and correctly
Checking Back	0	Not checking the results of the work
	1	Checking the results of the work, there are still miscalculations.
	2	Checking the results of work and no calculation errors

Source: Anisah (2015)

The assessment rubric's maximum and minimum scores are 10 and 0. To calculate the learner's ability score in problem-solving as follows:

$$S = \frac{R}{N} \times 100 \dots \dots \dots \text{(Equation 1)}$$

Description:

S = Expected score

R = Number of scores from items or questions answered correctly

N = Maximum score of the test

The results of the student scores are grouped based on the category of problem-solving ability, as in Table 2. Indicators of research achievement in the form of teacher categories in applying the Creative Problem Solving learning model are classified as "good," and 80% of students can get a minimum score of 75 in solving problems using the help of work cards.

**Table 2. Categories Problem Solving Ability**

Score	Ability Level
$90 \leq S \leq 100$	Very high problem-solving ability
$80 \leq S \leq 89$	High problem-solving capabilities
$65 \leq S \leq 79$	Moderate problem-solving capabilities
$55 \leq S \leq 64$	Low problem-solving capabilities
$0 \leq S \leq 54$	Deficient problem-solving capabilities

Source: Purwanto (2018)

## RESULT AND DISCUSSION

### Learners' Problem Solving Ability Data

The scores of problem-solving abilities that learners collected through tests at the end of each cycle I and II as shown in Table 3.



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**Tabel 3. Learners' Problem-Solving Ability Test Results**

Category	Achievement Indicators 80%					
	Sum of Learners			Percentage		
	Pre-Action	Action first cycle	Action second cycle	Pre-Action	Action first cycle	Action second cycle
Complete	14	24	27	42,42%	73%	84%
Incomplete	19	9	5	58%	27%	16%
Total	33	33	32	100%	100%	100%

Based on the results of the problem-solving ability test in cycles I and II, it can be seen that the CPS model has succeeded in improving students' problem-solving ability. In cycle II, there has been an increase of 11% of students who have problem-solving skills. In addition, teachers have carried out the CPS stages correctly so that students feel facilitated in improving their problem-solving skills (see Table 4)

**Tabel 4. Problem Solving Ability Test Results Per Indicator**

Capability Indicators	Pre-Action	Action first cycle	Action second cycle
Understanding the problem	43,43	69,7	80,61
Planning a Settlement	69,7	75,45	82,12
Executing the Plan	59,6	68,89	81,01
Checking	62,12	73,94	77,88
Average Score	58,71	71,99	80,4
Scale	Low	Moderate	High

Based on Table 4, it can be seen that there is an increase in students' problem-solving ability. However, compared with the indicators of research success, the results of cycle one research cannot be said to be successful. This can be seen from the study's results, which are still less than 75%. Based on the observations made by teachers and researchers, there are several obstacles to its implementation, including; (1) In the first cycle, the implementation of the model is still not optimal. This happens because teachers and students still do not fully master the syntax of the *Creative Problem Solving* model; (2) Learners have not entirely created new variations of answers or methods of completion, and learners, most groups still answer according to the steps described by the teacher; (3) At the time of the post-test, some students were still cheating. Based on these reflections, the improvements made by the teacher are (1) re-understanding the syntax of *creative problem solving*; (2) exploring the creativity of students by providing longer time for brainstorming sessions, (3) Dealing with cheating, teachers make the number of cycle II test questions more types in cycle II so that they experience an increase in cognitive aspects.

In the first cycle, the average score obtained was 71.99 (moderate category). The non-achievement of the research achievement indicator was related to the fact that there were still students who had difficulty criticizing what was informed in the questions. This happens because the students are not yet evident in the first stage, namely the stage of clarifying the problem. At this stage, the teacher lacks detail in explaining the tasks that students must do. As a result, students still make many mistakes in calculating the balance on the account mutation. This also makes the indicators a common understanding of the problem.

In carrying out plans, students still often make mistakes in steps to solve problems such as calculating taxes before interest and other mistakes in calculating

numbers. This happens because the teacher has not provided many alternatives or examples of how to answer problems. As a result, students still follow the way of solving the problem according to the examples in the book. Conditions like this result in a lack of ability to carry out the plans that have been made.

The second cycle shows that the average score obtained is 80.40 (high category), with the percentage of students who obtained a score of more than 75, namely 84% (27 students). Low indicators in cycle I have increased in cycle II, especially in indicators of understanding problems, because learners can ignore unnecessary information and focus on the information needed to enter the next stage of learning. Students' creativity also increased in cycle II with the discovery of the lowest balance settlement method that was faster in terms of units of time. The syntax in the *Creative Problem Solving* learning model directs and guides students to find solutions to their problems using creatively processed learning experiences to solve problems more effectively.

The analysis results in Table 4 can be seen as an increase in indicators of problem-solving, especially indicators of understanding the problem and running a plan. Referring to the indicators of problem-solving ability proposed by Anisa (2015), at the end of this cycle, students are already better able to deepen problem situations, sort out facts, determine the relationship between facts and make formulations of problem questions. Learners already understand information through an iterative reading process. In addition, in learning, it can be seen that the teacher has helped to compile a solution plan by considering the structure of the problem and the questions that must be answered. Students are conditioned to have experience in applying various kinds of problem-solving strategies carefully and carefully so that the plans that have been made can be implemented as well as possible. If inconsistencies arise when implementing the plan, students are invited to be reviewed to find the source of the problem's difficulty. In addition, students have also been seen to be trained to check in working on the given cases.

### **Data on the Application of Creative Problem Solving Models**

The teacher's performance in *applying the Creative Problem Solving* learning model assisted by work cards lasts for two cycles. Based on the results of observations, it can be seen that the teacher's performance is seen in Table 5.

Based on the data in Table 5, it can be seen that there is an increase in teacher performance in applying the Creative Problem Solving learning model by utilizing work card learning media. The improvement is related to the results of tests, interviews, and observations in cycle I which are the subject of reflection considerations for teacher performance in cycle II to be better and more effective in teaching. Based on the observations of the cycle I, teacher performance is still low on the syntax of problem clarification and implementation because of the constraints on facilities and infrastructure. The teacher cannot explain to the students how to criticize and sort out the information on the questions. Another reason is that the teacher does not reprimand the crowded group and interferes with the presentation. In addition to these factors, another factor is the absence of variations in the answers to the results of group discussions because all groups present use the lowest balance method without certain modifications.

Analysis at the reflection stage is a factor in increasing teacher performance in cycle II, especially in low indicators in cycle I. Increasing observation scores on problem clarification indicators is evidenced by teachers being better at preparing infrastructure so that teachers are more precise in explaining problems in cycle II and



easier to coordinate students in class. Another improvement at the stage of expressing ideas is evidenced by the teacher encouraging students' creativity in solving problems. The teacher's efforts to increase creativity are by giving students a longer syntax time for expressing ideas so that students are more flexible in finding ways to do giro savings problems faster. The alternative method students support this find on the lowest balance method. The overall results of the observation instrument showed that the improvement in teacher performance from what was initially included in the moderate category increased to the high category.

The improvement of students' problem-solving abilities is encouraged by applying the syntax of the *Creative Problem Solving* learning model with the help of work. This is in line with the results of research from Hobri, Ummah, & Yuliati (2020) that the CPS model can improve problem-solving ability. The problem clarification syntax can improve the learner's understanding of the problem. In the first stage in the CPS model, which is clarifying the problem, the teacher explains the problem to the learners so that students can understand what kind of solution is expected. At this stage, the teacher helps students to optimize one of the indicators of problem-solving ability, namely the ability to understand problems. Learners discuss problem situations or illustrations presented by the teacher and brainstorm a number of goals or objectives that can be used for students' creative work. Throughout this process, students are expected to be able to make a consensus on the goals to be achieved by the group (van Hooijdonk, Mainhard, Kroesbergen, & van Tartwijk, 2020).

**Tabel 5. The Data of Observation of the Implementation of the CPS Model Syntax**

Cycle	Performance Presentation				Total
	Clarification of the issue	Disclosure of opinions	Clarification of the issue	Clarification of the issue	
First cycle					
Obs. 1	66	71	66	67	67,50
Obs. 2	63	67	68	63	65,25
Sum of score	129	138	134	130	
Average score	64.5	69	67	65	66,38
Category	low	moderate	moderate	moderate	moderate
Second cycle					
Obs. 1	85	84	85	85	84,75
Obs. 2	82	81	82.5	80.5	81,50
Sum of score	167	165	167.5	165.5	
Average score	83.5	82.5	83.75	82.75	83,13
Category	high	high	high	high	high

The syntax of expressing ideas affects the ability of learners to plan for completion. Teacher performance gives students time and opportunities to look for various methods to give birth to student creativity and freedom. Opinion from Utami et al. (2021) In between the expression of ideas, learners generate as many ideas as possible by being driven by a sense of criticality and freedom to stimulate maximum output in the form of methods used at a later stage. In line with this opinion, students have also succeeded in pocketing several methods that can be used to solve feelings and find ways to apply the lowest balance method that is more efficient for solving problems on the work card. Also supported by Oleh Zubaidah & Malang (2017) the

stage of expressing ideas, students compile as many ideas as possible to support the truth of the concepts believed so that students get the best solution.

The syntax of evaluation and selection affects the ability of students to plan completion. Teacher performance that directs learners to choose the most appropriate completion method can improve learners' ability to plan for completion (Treffinger, Isaksen, & Stead-Dorval, 2006). Students can choose a method according to their respective understandings at this stage. Evaluating and selecting causes variations in the answers chosen by each student. In addition, students can prioritize the chosen method compared to other methods that are considered inappropriate. In line with the opinion of Hariani (2019), during the evaluation or selection phase, learners evaluate the pros and cons of each suggestion or method, eliminate unnecessary ones, and modify the method to decide on a single choice of method used. This condition is also supported by As-salam et al. (2018) and Syarifudin et al. (2019) that each group's evaluation and selection stages discuss suitable and appropriate methods of solving the problem.

Implementation of syntax can improve learners' ability to execute plans. The performance of teachers who direct students to apply the methods that have been chosen can improve the ability of students to carry out plans. This is shown by the flow of students carrying out plans starting from entering information on the questions into the implemented completion method. After that, students look for current account interest and taxes based on the flow of work using the settlement method. This fact is supported by Sari, Ikhsan, & Abidin (2018) opinion that the implementation stage consists of developing the chosen method for problem-solving. Other opinions also reinforced this fact and reported by Syarifudin, Hendra & Sisriwati (2019) that the CPS model is a methodological framework designed to help solve problems by using creativity in achieving goals and improving creative performance.

The implementation of syntax affects the improvement of students' ability to re-examine. The performance of teachers in checking the results of discussions has proven to improve students' ability to re-examine the results of their work. This is because before the teacher checks the results of the discussion presented by the students, the teacher reminds the students to re-examine the results of their work, starting from recognizing information, looking for various methods, and choosing methods to implement these methods. Warnings from teachers shape the character of learners to get used to re-examine the results of their work before being collected to the teacher during learning and testing. It is also supported by the opinion of (As-salam et al., 2018) and Wieth, Francis, and Christopher (2019) that the implementation stage helps learners implement strategies until they find solutions and familiarize themselves with creative steps in solving problems.

## CONCLUSION

Based on data analysis and discussion of the results of this study, it can be concluded that the application of the Creative Problem Solving learning model assisted by work cards can improve the problem-solving ability of class X Accounting 3 students of SMKN 1 Surakarta on the subject matter of giro savings. This is obtained based on an analysis that shows an increase in students' problem-solving ability in each indicator which consists of the ability to understand problems, the ability to plan solutions, the ability to carry out plans, and the ability to re-examine the results of work. In addition, in cycles 1 and 2, it can be seen that the teacher's performance in implementing the Creative Problem Solving model is continuously increasing.





Teachers seem to be utilizing the results of reflections in the previous cycle to improve the application of the Creative Problem Solving model to improve problem-solving skills. The limitation of this study lies in the difficulty of improving the ability of students to understand problems and carry out plans, especially in cycle I. This is because students still have difficulty understanding the cognitive structure of current account saving problems, which impact the stage of carrying out plans in cycle I. Teachers also experience technical problems delivering material in cycle I because school facilities are unsupportive. The implication of this study for the following research is to provide a stimulus activity that can increase students' creativity in clarifying the problem because if the learner does not understand the problem well, it will have an impact on the following syntax. Theoretically, this research applies the Creative Problem Solving learning model assisted by work cards, which can improve problem-solving ability in giro learning, especially in giro savings materials. In addition, the contribution of this research is practically for teachers, namely that teachers can apply innovative learning models in providing learning experiences to students, and also students become active in finding their solutions to the problem of savings.

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