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ANALYSIS OF COLLABORATIVE PROBLEM SOLVING LEARNING

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Abstract

This research aims to analyze Collaborative Problem Solving (CPS) learning at Elementary School 9 Namang, Central Bangka Regency. The method used in this research is qualitative using the Miles and Huberman model. The results of this research are that in project-based Collaborative Problem Solving (CPS) learning practices, the main obstacles faced by teachers are mainly related to class I, where students are still learning to read and write, experiencing a lack of attention and focus. However, progressive development is seen from class III to class VI, where students are faced with increasingly complex challenges, such as designing projects that are relevant to the curriculum and looking for project ideas from literature. Case-based Collaborative Problem Solving (CPS) learning is designed to develop critical thinking and problem solving skills along with grade level. Simulation-based Collaborative Problem Solving (CPS) learning in grades I-VI takes students through a series of progressive stages, starting from simple games that emphasize cooperation to real-world situations using technology and role-playing.

Keywords: Collaborative Problem Solving (CPS), Elementary School, Project, Case, Simulation.

Abstrak

Penelitian ini bertujuan untuk menganalisis pembelajaran Collaborative Problem Solving (CPS) Di Sekolah Dasar 9 Namang Kabupaten Bangka Tengah. Metode yang digunakan dalam penelitian ini merupakan kualitatif dengan menggunakan model Miles dan Huberman. Hasil dari penelitian ini yaitu dalam praktik pembelajaran Collaborative Problem Solving (CPS) berbasis proyek, kendala utama yang dihadapi oleh guru terutama terkait dengan kelas I, di mana siswa masih belajar membaca dan menulis, mengalami kurangnya perhatian dan fokus. Namun, perkembangan progresif terlihat dari kelas III hingga kelas VI, di mana siswa dihadapkan pada tantangan yang semakin kompleks, seperti merancang proyek yang relevan dengan kurikulum dan mencari ide proyek dari literatur. Pada pembelajaran Collaborative Problem Solving (CPS) berbasis kasus dirancang untuk mengembangkan keterampilan berpikir kritis dan pemecahan masalah seiring dengan tingkat kelas. Pembelajaran Collaborative Problem Solving (CPS) berbasis simulasi di kelas I-VI membawa siswa melalui serangkaian tahap progresif, mulai dari permainan sederhana yang menekankan kerja sama hingga situasi dunia nyata dengan penggunaan teknologi dan permainan peran.

Kata Kunci: Collaborative Problem Solving (CPS), Sekolah Dasar, Proyek, Kasus, Simulasi.



INTRODUCTION

The Collaborative Problem Solving (CPS) learning model can form a collaborative process between students in solving problems adapted from their own knowledge equipped with the initial knowledge possessed by each student (Gauvain, 2018). There is a theory around Collaborative Problem Solving (CPS) which shows the entire learning process is especially collaborative (Nuraeni & Zahra, 2021). Building readiness in students to apply learning collaboratively, including involving Collaborative Problem Solving (CPS) in developing group skills. Some examples of the application of Collaborative Problem Solving (CPS) in education are project-based learning, case-based learning, and simulation-based learning (Heath et al., 2020). According to Dr. Greene Collaborative Problem Solving (CPS) can be divided into three implementation bases, namely project-based learning, case-based learning, and simulation-based learning (Sun et al., 2020). The importance of Collaborative Problem Solving (CPS) practice as described above is to improve learning so that the complexity of the human social system increases in responding to problems, especially individuals and students. The relationship between learning and students' adaptive abilities cannot be separated from the intervention of a teacher (Johar & Hanum, 2021). Collaborative Problem Solving (CPS) is closely related to the demands of globalization and technological advances in the educational context. The need for competency in the era of globalization and technology is also experienced by education in Indonesia (Abdulatif, 2021).

Education in Indonesia is experiencing rapid development, in line with the demands of globalization and technological advances (Sukmayadi & Yahya, 2020). One aspect that is the main focus in educational development is the development of students' critical thinking skills and problem solving abilities. Collaborative Problem Solving (CPS) or collaborative problem solving learning is a learning model that can facilitate the development of these skills (Chen et al., 2020). Education in Indonesia faces big challenges in line with the dynamics of globalization and technological developments. Increasing competition in the global job market requires education systems to focus more on developing skills and competencies that are relevant to the demands of the 21st century (Hasibuan & Prastowo, 2019). One learning model that is considered capable of meeting these needs is Collaborative Problem Solving (CPS) or collaborative problem solving learning. Several studies have been conducted to explore the effectiveness of the Collaborative Problem Solving (CPS) model in educational contexts. Research by Talakua and Takaria (2022) revealed that the CPS model was effective in increasing the science self-concept of prospective elementary school teacher students at a State LPTK in Ambon, Maluku. Meanwhile, research by Nuraeni and Zahra (2021) shows that project-based learning is able to develop CPS skills and increase conceptual understanding of eighth grade students. Nursaadah, Toheri, and Heryandi (2022) found that



the application of the CPS model increased the Higher Order Thinking Skills (HOTS) of class VII students, while research by Ratnawati, Siswono, and Wijayanti (2020) highlighted that fourth semester students' understanding of statistical literacy, but was not yet able to reach certain indicators. Finally, research by Sun et al. (2020) proposed a CPS competency model that was tested in two different contexts, demonstrating validity in predicting subjective and objective outcomes across a variety of CPS interactive environments.

To evaluate Collaborative Problem Solving (CPS) in the Indonesian education system, you can start from a small scale in local education implemented by schools in cities and districts. One of the districts that needs to be evaluated is Central Bangka District, which is located in the Bangka Belitung Islands Province. Education in Central Bangka Regency has a strategic role in forming a young generation that is competent and ready to face global changes and increasingly complex job market demands. In this context, Collaborative Problem Solving (CPS) or collaborative problem solving learning is a model that plays an important role in improving the quality of learning and equipping students with relevant skills. Central Bangka, as an integral part of the Indonesian education system, is faced with various local and national challenges in implementing learning models that suit local and global needs. Therefore, analysis of the use of Collaborative Problem Solving (CPS) in learning in Central Bangka Regency is important to understand the extent to which this model can make a positive contribution to the development of education in this area. Research on the use of Collaborative Problem Solving (CPS) in learning can start from elementary school.

Elementary Schools (SD) have a very important role in building character education. Character education is a fundamental aspect in forming an individual's personality and morals. Through good character education efforts at the elementary school level, students can be equipped with a solid moral foundation to face challenges and take a positive role in society. Namang Elementary School 9 in Central Bangka Regency is an educational institution that has an important role in producing young people who have critical thinking skills and are able to solve problems collaboratively. Therefore, analysis of Collaborative Problem Solving (CPS) learning at Elementary School 9 Namang is an important need to ensure the effectiveness of implementing this learning model. In the context of Central Bangka Regency, there is still limited information regarding the extent to which the implementation of Collaborative Problem Solving (CPS) learning at Elementary School 9 Namang has achieved the desired learning objectives. Apart from that, teachers at Elementary School 9 Namang experience difficulties in learning oriented towards higher level thinking skills and students' weak skills in higher level thinking. Therefore, in-depth research is needed to analyze how Collaborative Problem Solving (CPS) learning is implemented



at Namang Elementary School 9, the extent to which students achieve critical thinking skills and problem solving abilities, as well as factors that can influence the effectiveness of this learning.

Through a comprehensive analysis of Collaborative Problem Solving (CPS) learning at Elementary School 9 Namang, it is hoped that findings will be found that will make a significant contribution to improving the quality of education at the elementary level, especially in the aspect of developing students' critical thinking skills and problem solving abilities. It is hoped that these findings can become a basis for related parties in designing educational policies that are more effective and relevant to the development needs of students in this era of globalization. Based on the background above, researchers will explore more deeply the ability to adapt to each student in working together both between groups and individuals by using collaborative problem solving models and creating models or ways of solving problems faced by focusing on creative and innovative learning and solutions. The problem formulation of this research is: 1) How is project-based Collaborative Problem Solving (CPS) learning at SDN 9 Namang, Namang District, Central Bangka Regency? 2) How is case-based Collaborative Problem Solving (CPS) learning at SDN 9 Namang, Namang District, Central Bangka Regency? 3) How is simulation-based Collaborative Problem Solving (CPS) learning at SDN 9 Namang, Namang District, Central Bangka Regency?

RESEARCH METHODS

This research uses a qualitative research method with a phenomenological approach. The research location is at SDN 9 Namang, Namang District, Central Bangka Regency. The primary data source involved 9 respondents, such as school principals and class teachers. Secondary data was obtained from various school-related documents. Data collection techniques include observation, interviews and documentation. The data analysis technique uses the Miles and Huberman model, where data analysis is carried out through data reduction, data presentation, data verification, and drawing conclusions, paying attention to data validity through data triangulation.

RESULTS AND DISCUSSION

This research analyzes the effectiveness of Collaborative Problem Solving learning at SDN 9 Namang with a focus on student involvement, concept understanding, and problem solving abilities. Data from observations, questionnaires and interviews are analyzed to show their positive impact on the teaching and learning process. It is hoped that the results of the analysis and its implications can contribute to the development of learning models that are more innovative and oriented towards student progress.



Presentation of Research Data

Research data on Collaborative Problem Solving learning at SDN 9 Namang will be presented comprehensively. Data was collected through observation, questionnaires and interviews from teachers and school principals. The presentation of this data will be the basis for discussing implications and recommendations. The data analysis process follows the Miles and Huberman model, with data reduction, display and validation steps.

a) Data Reduction

The first step in the Miles and Huberman model data analysis is data reduction. Data reduction is a key element in the investigation and analysis of the implementation of collaborative learning models. The results of data reduction from interviews with 9 respondents showed, the findings from interviews with nine respondents at Namang 9 Public Elementary School demonstrate the successful implementation of Collaborative Problem Solving (CPS) learning across various subjects. Principal headmaster highlighted the sustainable integration of CPS into the curriculum, supported by teachers like fifth and sixth grade teachers, who emphasized student involvement in problem-solving and action planning. Teachers such as third and fourth grade teachers underscored the importance of group discussions and project-based learning to foster joint problem-solving skills. Physical education and health subject teacher discussed the application of CPS in Physical Education, facing challenges like limited resources and varying student abilities. Moreover, second grade teacher detailed CPS implementation in class II, adapting projects, cases, and simulations to students' levels and interests, though facing hurdles like differing skill levels. Furthermore, the integration of CPS into Islamic studies engages students in collaborative problem-solving rooted in Islamic values, promoting active learning and social skills development, albeit requiring significant teacher time and resources. These interviews collectively highlight the diverse yet effective application of CPS across subjects, emphasizing student engagement, creativity, and problem-solving skills development amidst various challenges.

b) Data Display

The implementation of Collaborative Problem Solving (CPS) at the Namang 9 Public Elementary School has a positive impact on the development of students' social and cognitive skills. The learning process that involves collaboration in joint problem solving has made a significant contribution to the student learning experience. The CPS model was identified as an effective means of increasing student engagement in the learning process, creating a dynamic and supportive learning environment. Teachers and school principals play an important role in implementing CPS, which has been integrated with the applicable curriculum and supported by adequate training and resources. The CPS learning process is

carried out through three models: projects, cases, and simulations, each of which provides students with different experiences. Through CPS learning, students not only improve their understanding of learning material, but also develop social skills such as communication, cooperation, and leadership. This model also helps students understand and apply Islamic teachings in daily life in a more real and meaningful way.

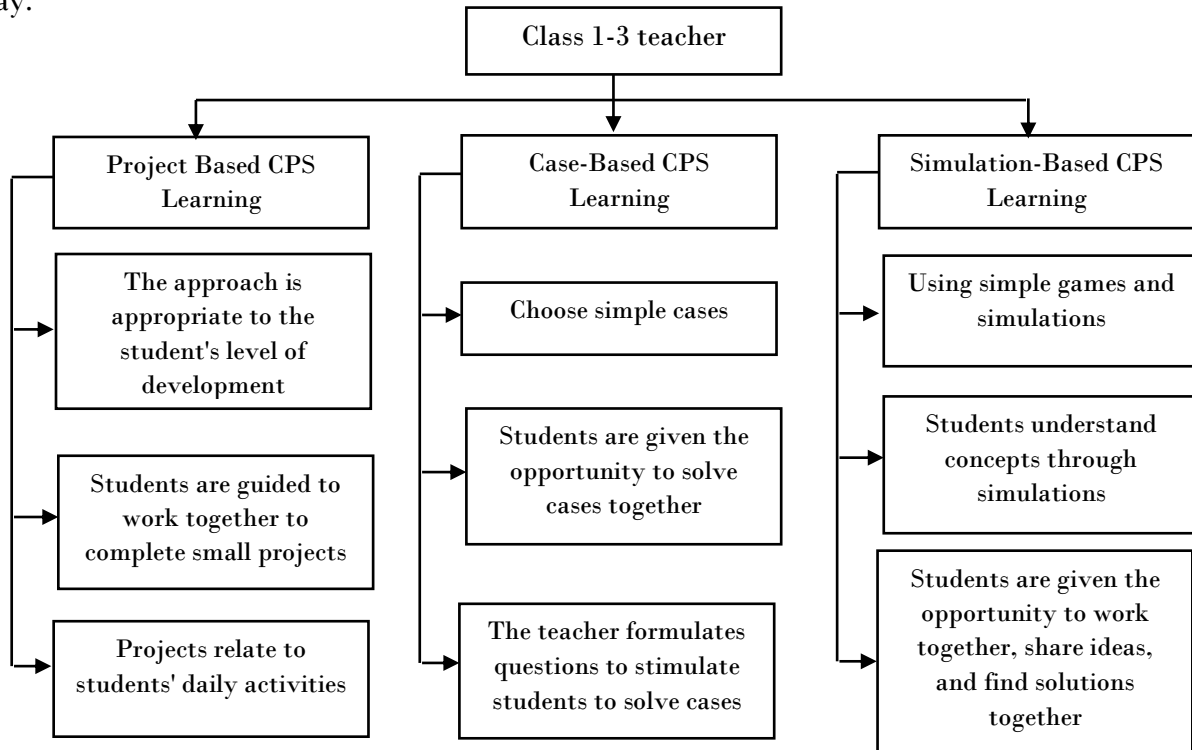


Figure 1. Display of Reduction Data from Interview Results with Under Class Teachers at Namang 9 State Elementary School

Source: Processed data, 2023

The picture above explains the implementation of Collaborative Problem Solving learning which is carried out in classes 1, 2 and 3 of the Namang 9 Public Elementary School. In practice, there are several obstacles faced by teachers when implementing Collaborative Problem Solving learning in grades 1, 2 and 3, such as lack of student attention and focus. This is because lower class students are currently aged 6 to 9 years, where children at this age are still not perfect in learning, especially learning to read and write. In project-based Collaborative Problem Solving learning, students are guided to complete small and simple projects. The projects are selected from activities that students usually do every day. Then in case-based Collaborative Problem Solving learning, students are given simple cases that will be solved together. In this case, the teacher guides by asking questions that stimulate students to discuss and convey their ideas in formulating solutions to overcome a case. Furthermore, in simulation-based Collaborative Problem

Solving learning, in practice students carry out simple games and simulations. In this case, students are encouraged to work together, share ideas in completing assignments. Next, the display of the reduced data depicting the results of interviews with grade 4, 5 and 6 teachers can be seen in Figure 1.2.

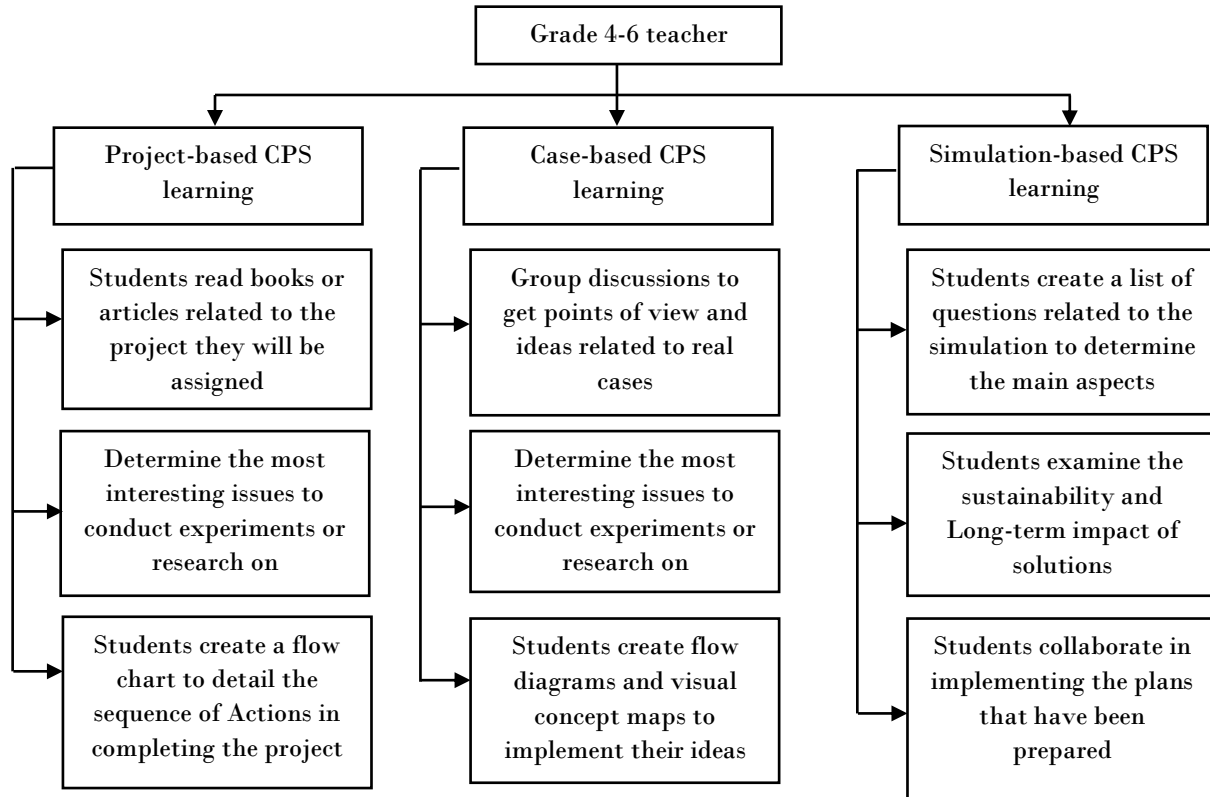


Figure 2. Display of Reduction Data from Interview Results with Upper Class Teachers at Namang 9 State Elementary School

Source: Processed data, 2023

In the upper classes (grades 4, 5, and 6) in project-based Collaborative Problem Solving Learning, students have started looking for project ideas from reading books and scientific articles. Then students determine the most interesting issues to conduct experiments, research, or the like. Next students create flow charts and visual diagrams to detail the sequence of Actions in completing the project. In the practice of case-based Collaborative Problem Solving Learning, students conduct group discussions to gain points of view and ideas related to real cases. Then students present their ideas to their classmates. Next, students create flow diagrams and visual concept maps to implement their ideas.

Simulation-based Collaborative Problem Solving learning in the upper classes is no less interesting. In this lesson, students create a list of questions related to the simulation to determine the main aspects.



Then students examine the sustainability and long-term impact of the solutions they put together. Next, students collaborate in implementing the plans that have been prepared.

e) Data validation

The implementation of Collaborative Problem Solving learning at the Namang 9 Public Elementary School has achieved several positive achievements. The implementation of this learning will begin in 2022 and will continue to be carried out in a planned and sustainable manner. The research results show that Collaborative Problem Solving learning has been successfully integrated with the curriculum in force at the school, indicating a close connection between this learning model and the established educational standards. Apart from that, the involvement of the school in providing facilitation to teachers through training confirms their commitment to developing Collaborative Problem Solving learning. This facilitation, including the provision of adequate resources, is an important step in supporting the smooth running and improving the quality of learning.

Research Data Analysis

Analysis of research data in this study reflects several obstacles and developments in the implementation of Collaborative Problem Solving (CPS) learning at the Namang 9 Public Elementary School. Piaget emphasized that children at an early age are still in the concrete operations stage, where the ability to think abstractly has not yet fully developed (Istiqomah & Maemonah, 2022). Obstacles in class I, such as students' lack of attention and focus, may be explained by these cognitive limitations. Teachers need to understand students' level of cognitive development and adapt teaching strategies to suit that stage. Then Vygotsky's theory emphasized the importance of social interaction in learning. In this context, project-based Collaborative Problem Solving (CPS) learning can be seen as an implementation of the concept of constructivism (Yohanes, 2010). The concept of progressiveness in case-based Collaborative Problem Solving (CPS) learning reflects the principles of constructivism, where students actively build their knowledge through interaction with learning material. Progression in simulation-based CPS learning reflects the principles of active learning. Students not only receive information, but are also actively involved in games, simulations, and problem solving, in accordance with active learning theory. Then the application of simulation in joint problem solving and use of technology reflects Vygotsky's constructivism model. Vygotsky emphasized the important role of social interaction and the use of tools or symbols in learning. The use of technology and simulation provides tools for strategy visualization, supporting the formation of shared understanding. Research findings on the effectiveness of simulation-based learning support the use of simulations to increase student engagement and learning effectiveness (Muzana et al., 2021). Research conducted by Muzana et al. (2021) shows that simulations can improve understanding of



concepts and problem solving skills, as well as allowing direct experience in situations that can be applied in real life. Furthermore, the use of virtual sports simulations in Physical Education subjects reflects an applicable and contextual model. It integrates simulation with subject context, giving students problem-solving experience related to the real world.

Piaget emphasized that learning occurs through action, while Vygotsky highlighted the important role of social interaction in learning. In this sentence, students are involved in joint problem solving, problem identification, and critical evaluation, all of which support the concept of constructivism. Teachers need to facilitate collaboration between students to overcome obstacles such as lack of attention and focus, because social interaction can enrich students' understanding. Previous research conducted by Juwantara in 2019 highlighted that at this age, students are still learning to read and write, so they need learning strategies that are more adapted to their developmental stage (Juwantara, 2019). The concept of progressiveness in the level of difficulty and complexity of simulation-based CPS learning at the Namang 9 State Elementary School reflects Piaget's theory of cognitive development. Piaget emphasized that children go through different stages of development. Initially, simple games in class I correspond to children's concrete operations stage, while at higher levels, such as class VI, the complexity of projects increases according to more mature abstract thinking abilities.

Dewey's progressivism model can be applied in looking at the development of Collaborative Problem Solving (CPS) learning from class III to class VI. This theory emphasizes real experience and contextual problem solving (Mustaghfiroh, 2020). In this case, progressivism can be interpreted as an increase in project complexity, which reflects the evolution of students' understanding of Collaborative Problem Solving. This sentence reflects the active learning model adopted by John Dewey's progressivism theory which is also applied to case-based Collaborative Problem Solving (CPS) learning at the Namang 9 Public Elementary School. Students not only receive information, but are also actively involved in problem solving, discussion, and critical evaluation. This principle allows students to be directly involved in the learning process and experience the application of concepts in real-world contexts. Gardner's multiple intelligence theory shows that each student has different intelligence (Syarifah, 2019). In the context of project-based Collaborative Problem Solving (CPS) learning, teachers need to accommodate students' various learning styles and intelligence, for example by providing opportunities for students to design and carry out activities in Physical Education subjects. The concept of active learning emphasizes direct student involvement in the learning process (Syaparuddin et al., 2020). Previous research conducted by Hamidah (2019) indicated that the development of project-based CPS learning was seen progressively



from class III to class VI. This indicates an awareness of increasing project complexity as grade level increases, reflecting efforts to meet increasing challenges over time.

Collaborative Problem Solving (CPS)-based projects in class VI, which involve thorough evaluation, selecting solutions, and planning concrete steps, reflect students' active participation in learning. Students in class VI are faced with increasingly complex challenges, such as designing projects that are relevant to the curriculum and looking for project ideas from literary sources. This reflects the role of developing problem-solving skills and project literacy as school levels progress. Previous research conducted by Ediana et al. (2023) shows that in class VI, students are actively involved in a thorough evaluation of project ideas, selecting the best solution, and planning concrete steps for implementing the idea. This reflects the active learning model applied in project-based CPS learning. However, the Collaborative Problem Solving (CPS) learning context is case-based, the emphasis is on developing critical thinking skills in accordance with Ennis' theory about critical thinking. Students not only receive information passively, but are also invited to identify problems, determine solutions, and carry out critical evaluations of ideas that emerge (Richmond, 2007). It reflects the development of critical thinking skills through instructional practices throughout the grade levels.

Apart from Ennis's theory of critical thinking, case-based Collaborative Problem Solving (CPS) learning at the Namang 9 Public Elementary School also applies real-world contexts in accordance with Jerome Bruner's cognitive constructivism model. By engaging in everyday problem solving through discussion and problem identification, students have the opportunity to apply the concepts learned in relevant and contextual situations (Kurniawan, 2021). Apart from that, Ausubel's progressive learning theory highlights the importance of concept-based and structured learning. Case-based Collaborative Problem Solving (CPS) learning at the Namang 9 Public Elementary School reflects progress in the complexity of problem solving throughout grade levels, supporting the concept of progressive learning. The application of the theories above can provide a conceptual basis for designing case-based CPS learning strategies that are more effective and appropriate to students' developmental needs.

1) Project-based Collaborative Problem Solving learning

The results of interviews with grade 1 to grade 6 teachers and physical education and health subject teachers at the Namang 9 Public Elementary School are an integral part of this research which aims to analyze the implementation of project-based Collaborative Problem Solving learning. These in-depth interviews were designed to understand teachers' perspectives regarding teaching strategies, challenges faced, and the impact of collaborative learning on students. Through the interviews, several key themes emerged, including teachers' understanding of the principles of Collaborative Problem Solving,



their role in facilitating collaboration between students, and strategies implemented to motivate students' active participation. Teachers emphasize the importance of collaboration in learning as the main key in developing students' social skills and problem solving. They note that involving students in joint projects allows them to learn not only from the teacher, but also from each other.

The interviews also revealed the challenges faced by teachers in implementing collaborative learning. Some of these include time management, diversity of student levels of understanding, and managing group dynamics. Teachers consistently emphasized their role as facilitators in supporting student collaboration. They create an environment that supports positive interactions, provides guidance, and provides constructive feedback. Interviews revealed that teachers regularly evaluate the effectiveness of collaborative learning. They are also willing to make adjustments in their teaching models to ensure that learning objectives are achieved. Teachers share their experiences in stimulating students' motivation to actively participate in collaborative learning. This includes using interesting project-challenges, providing relevant context, and providing recognition for student contributions.

Interviews highlight teachers' practices in evaluating student progress in Collaborative Problem Solving learning. They use various forms of assessment, including observations, projects, and formative assessments. The interview results reflect the alignment between collaborative learning and the school curriculum. Teachers try to combine these learning principles with existing curriculum standards. Analysis of the interview results provides in-depth insight into the implementation of project-based Collaborative Problem Solving learning in grades 1 to 6 at the Namang 9 Public Elementary School. By understanding teachers' perspectives, this research can make a real contribution to the development of collaborative learning practices at the elementary school level. Project-based Collaborative Problem Solving (CPS) learning practices in grades I to VI at the Namang 9 Public Elementary School face a number of obstacles, especially in grade I. The main challenge is the lack of student attention and focus, which can be attributed to the age of the students who are still learning to read and write. However, with a small and simple project model, such as making a storybook, teachers can guide students through collaborative learning well.

Progressively, from class III to class VI, the project-based CPS learning model becomes more complex. Students are given increasingly challenging challenges, from designing projects that are relevant to the curriculum to looking for project ideas from literary sources such as books and scientific articles. The project completion process at the sixth grade level includes a comprehensive evaluation of emerging ideas, selecting the best solution, and planning concrete steps to implement the idea. In Physical Education subjects, project-based CPS learning practices provide students with the opportunity to design and implement activities. The teacher's role as project facilitator and guide allows for more in-depth



evaluation of student assessments, providing constructive feedback for further development. Despite facing several obstacles, the implementation of project-based CPS learning in elementary schools shows a positive evolution in the development of students' collaborative and problem-solving skills from lower to higher grade levels. Implementing this model gives students real-world experience in working together, designing projects, and making decisions, all of which are important aspects of student skill development.

2) Case-based Collaborative Problem Solving learning

In this research, an in-depth analysis was carried out on the results of interviews with grade 1 to grade 6 teachers at the Namang 9 Public Elementary School regarding the implementation of case-based Collaborative Problem Solving (CPS) Learning. This analysis aims to understand in detail how case-based learning strategies are applied in order to improve students' collaborative and problem-solving skills. Teachers from grades 1 to 6 said that the application of case-based learning has become an integral part of their teaching model. The cases presented cover the context of students' daily lives, allowing them to be actively involved in solving problems relevant to their experiences. Through interviews, it appears that case-based learning is effective in developing students' problem solving skills. Teachers highlighted positive changes in students' ability to identify, analyze and formulate solutions to problems derived from given cases. The results of the analysis show that case-based learning encourages collaboration between students. Through discussion and comparison of ideas, students learn to work together to find optimal solutions, creating a learning environment that supports the exchange of ideas and experiences.

Teachers admit that using cases as a learning tool can increase student motivation. Cases that are interesting and related to students' realities help arouse their interest in being actively involved in the learning process. However, the interview results also identified several obstacles in implementing case-based learning. One of the main obstacles is the challenge of managing enough time for case analysis and group discussions without sacrificing other learning material. The analysis shows that the teacher's role as a facilitator is very important in case-based learning. The teacher serves as a mentor who guides discussions, motivates students to participate, and provides necessary direction during case analysis.

Teachers highlighted the importance of adapting cases according to the level of intelligence and development of students in each class. This creates a more relevant learning experience and adapts to students' abilities to understand and solve problems. The analysis also includes aspects of case-based assessment. The teachers detailed that assessment was carried out through participatory observation during group discussions, presentation of solutions, and the quality of individual answers to questions related to the case. Case-based Collaborative Problem Solving learning is designed to progress with grade level. At each level, students are involved in solving problems together through discussion, problem



identification, determining solutions, and critical evaluation. This model emphasizes interactivity, student involvement, and application of concepts in real-world contexts. With this progressive model, students not only learn to work together but also develop deep critical thinking and problem-solving skills over time. In class I case-based Collaborative Problem Solving learning, students are given simple cases that will be solved together. In this case, the teacher guides by asking questions that stimulate students to discuss and convey their ideas in formulating solutions to overcome a case.

Case-based Collaborative Problem Solving learning in class I-III with a focus on determining case objects in small problems can be arranged in an interactive and interesting way for students. The teacher begins the lesson with an introduction to the concept of case objects in small problems. For example, teachers can use examples of small everyday problems that are relevant to students. Students are invited to discuss what objects could be cases in the problem. The teacher provides guided questions to guide students in identifying these objects. Class IV case-based Collaborative Problem Solving learning, students formulate detailed questions about real cases. Students are required to understand the essence of the problem and determine a specific direction to solve it. Then you can vote and poll within the group to determine the solution that is most approved. Class V case-based Collaborative Problem Solving learning, students carry out group discussions to get points of view and ideas related to real cases. Then students present their ideas to their classmates. Next, students create flow diagrams and visual concept maps to implement their ideas. Class VI case-based Collaborative Problem Solving learning, students identify problems that arise and understand the case in depth. Then students look for information from various sources related to the issues that arise. Next, choose the best solution by critically evaluating each idea that emerges. Collaborative Problem Solving learning is case-based in physical education subjects, students are given cases in games and exercises for joint problem solving. Then Students are encouraged to design solutions together and collaborate. Next, the teacher, as a facilitator, provides guidance and direction when students analyze the case.

3) Simulation-based Collaborative Problem Solving learning

Data analysis from research interviews shows that simulation-based Collaborative Problem Solving learning is applied progressively at various grade levels with a creative and interactive model. At grade levels I and II, students engage in simple games and simulations that emphasize cooperation and sharing ideas. At the third grade level, the use of technology is introduced to provide an additional dimension, increasing the level of student engagement in real-world situations. At the third grade level, the use of technology is introduced to provide an additional dimension and assess student performance. In Physical Education subjects, the application of simulation includes creating virtual sports situations and



using software to visualize game strategies. The fourth grade level involves students in role-playing and creating decision matrices with specific criteria, encouraging the development of creativity and problem-solving skills. The fifth grade level encourages students to evaluate the long-term impact of the solutions they put together, leading to deeper understanding. Overall, simulation-based Collaborative Problem Solving learning is arranged progressively from grade I to grade VI. Each level brings a higher level of complexity and hones the student's skills gradually.

The entire learning process involves collaboration in groups, with students encouraged to discuss, share ideas, and work together to achieve certain goals. The Physical Education course combines virtual sports situations and practice scenarios to require joint problem solving, demonstrating the diverse applications of this model in various learning contexts. This analysis reflects a holistic model of the use of simulation-based Collaborative Problem Solving learning in increasing student engagement, developing creative and problem solving skills, as well as progressiveness in learning. Simulation-based Collaborative Problem Solving learning in classes I-VI takes students through a series of progressive stages. In the early levels, students engage in simple games that emphasize cooperation and sharing ideas. The level of difficulty and complexity increases as the grade progresses, involving real-world situations, use of technology, and role-playing. Teachers provide guidance and guidelines to help students achieve game goals and develop creativity in implementing solution plans. At the sixth grade level, students are expected to identify and overcome potential challenges by exploring literature or other resources. Physical Education subjects apply virtual sports simulations to involve students in joint problem solving, with the use of software for visualizing game strategies. All of these models aim to increase student engagement, creativity, and problem-solving skills throughout their learning journey.

CONCLUSION

The conclusion of this research is: in project-based learning, the main obstacle in project-based CPS practice occurs especially in class I due to the lack of attention and focus of students who are still learning to read and write. However, from class III to VI, project development was progressive. Students at this level face increasingly complex challenges and engage in thorough evaluation of project ideas, selecting the best solutions, and planning concrete steps for implementing those ideas. In Physical Education subjects, project-based CPS gives students the opportunity to design and implement activities. Then in case-based learning, case-based CPS is designed to develop along with grade level. Students at every level are involved in joint problem solving through discussion, problem identification, solution determination, and critical evaluation. This model emphasizes interactivity, student involvement, and



application of concepts in real-world contexts, so that students not only learn to work together but also develop deep critical thinking and problem-solving skills. Furthermore, in simulation-based learning, simulation-based CPS in classes I-VI takes students through a series of progressive stages. The level of difficulty and complexity increases as the grade progresses, involving real-world situations, use of technology, and role-playing. Physical Education subjects apply virtual sports simulations to involve students in joint problem solving, with the use of software for visualizing game strategies. From the results obtained in this research, there are several recommendations that can be carried out by the Namang 9 State Elementary School, namely holding periodic workshops or training for teachers to improve skills in designing and implementing project-based Collaborative Problem Solving (CPS) learning. Then integrate the use of technology as a tool in presenting cases or simulations to increase student interest. Furthermore, increased collaboration between teachers and technology developers to ensure the relevance and effectiveness of simulations in Collaborative Problem Solving (CPS) learning.

REFERENCE

- Abdulatif, S. (2021). Dampak pandemi terhadap eksistensi pendidikan di era digital. *Jurnal Pendidikan Tambusai*, 5(1), 1567–1570.
- Chen, L., Inoue, K., Goda, Y., Okubo, F., Taniguchi, Y., Oi, M., Konomi, S., Ogata, H., & Yamada, M. (2020). Exploring factors that influence collaborative problem solving awareness in science education. *Technology, Knowledge and Learning*, 25, 337–366. <https://doi.org/10.1007/s10758-020-09436-8>
- Ediana, D., Andriani, N., Ilmi, A. R. M., Rinovian, R., & Zulfikhar, R. (2023). Pembelajaran Berbasis Proyek Melalui Aplikasi dan Platform WEB: Kajian Literatur Terhadap Pengembangan Keterampilan Holistik Siswa. *Jurnal Review Pendidikan Dan Pengajaran (JRPP)*, 6(3), 860–866.
- Gauvain, M. (2018). Collaborative problem solving: Social and developmental considerations. *Psychological Science in the Public Interest*, 19(2), 53–58. <https://doi.org/10.1177/1529100618813>
- Hamidah, A. (2019). *Efektivitas model pembelajaran pjbl dengan pendekatan stem terhadap kemampuan creative problem solving dan metacognitive skill peserta didik pada pembelajaran fisika*. UIN Raden Intan Lampung.
- Hasibuan, A. T., & Prastowo, A. (2019). Konsep Pendidikan Abad 21: Kepemimpinan Dan Pengembangan Sumber Daya Manusia Sd/Mi. *MAGISTRA: Media Pengembangan Ilmu Pendidikan Dasar Dan Keislaman*, 10(1). <http://dx.doi.org/10.31942/mgs.v10i1.2714>
- Heath, G. H., Fife-Schaw, C., Wang, L., Eddy, C. J., Hone, M. J. G., & Pollastri, A. R. (2020). Collaborative Problem Solving reduces children's emotional and behavioral difficulties and parenting stress: Two key mechanisms. *Journal of Clinical Psychology*, 76(7), 1226–1240. <https://doi.org/10.1002/jclp.22946>
- Istiqomah, N., & Maemonah, M. (2022). Konsep dasar teori perkembangan kognitif pada anak usia dini menurut jean piaget. *Khazanah Pendidikan*, 15(2), 151–158. <https://doi.org/10.30595/jkp.v15i2.10974>
- Johar, R., & Hanum, L. (2021). *Strategi Belajar Mengajar: Untuk Menjadi Guru yang Profesional*. Syiah Kuala University Press.



- Juwantara, R. A. (2019). Analisis teori perkembangan kognitif piaget pada tahap anak usia operasional konkret 7-12 tahun dalam pembelajaran Matematika. *Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, 9(1), 27–34.
- Kurniawan, W. Y. (2021). Implementasi Teori Belajar Konstruktivistik Jerome Bruner dalam Pembelajaran Pendidikan Agama Islam di SMP Negeri 9 Yogyakarta. *ISLAMIKA*, 3(1), 21–37. <https://doi.org/10.36088/islamika.v3i1.917>
- Mustaghfiroh, S. (2020). Konsep “merdeka belajar” perspektif aliran progresivisme John Dewey. *Jurnal Studi Guru Dan Pembelajaran*, 3(1), 141–147. <https://doi.org/10.30605/jsgp.3.1.2020.248>
- Muzana, S. R., Lubis, S. P. W., & Wirda, W. (2021). Penggunaan simulasi phet terhadap efektifitas belajar IPA. *Jurnal Dedikasi Pendidikan*, 5(1), 227–236. <https://doi.org/10.30601/dedikasi.v5i1.1587>
- Nuraeni, F., & Zahra, Z. N. (2021). Proyek Desain Rekayasa Dalam Pembelajaran Ipa Untuk Meningkatkan Collaborative Problem Solving Dan Pemahaman Konsep. *LENSA (Lentera Sains): Jurnal Pendidikan IPA*, 11(2), 47–59. <https://doi.org/10.24929/lensa.v11i2.162>
- Nursaodah, N., Toheri, T., & Heryandi, Y. (2022). Penerapan Model Pembelajaran Collaborative Problem Solving (CPS) Dalam Meningkatkan Higher Order Thinking Skills (HOTS) Siswa Kelas VII. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 6(3), 3296–3306. <https://doi.org/10.31004/cendekia.v6i3.1448>
- Ratnawati, O. A., Siswono, T. Y. E., & Wijayanti, P. (2020). Statistical literacy comprehension of students in the context of covid-19 with Collaborative Problem Solving (CPS). *Math Didactic: Jurnal Pendidikan Matematika*, 6(3), 264–276. <https://doi.org/10.33654/math.v6i3.1051>
- Richmond, J. E. D. (2007). Bringing Critical Thinking to the Education of Developing Country Professionals. *International Education Journal*, 8(1), 1–29.
- Sukmayadi, V., & Yahya, A. H. (2020). Indonesian education landscape and the 21st century challenges. *Journal of Social Studies Education Research*, 11(4), 219–234.
- Sun, C., Shute, V. J., Stewart, A., Yonehiro, J., Duran, N., & D’Mello, S. (2020). Towards a generalized competency model of collaborative problem solving. *Computers & Education*, 143, 103672. <https://doi.org/10.1016/j.compedu.2019.103672>
- Syaparuddin, S., Meldianus, M., & Elihami, E. (2020). Strategi pembelajaran aktif dalam meningkatkan motivasi belajar pkn peserta didik. *Mahaguru: Jurnal Pendidikan Guru Sekolah Dasar*, 1(1), 30–41.
- Syarifah, S. (2019). Konsep kecerdasan majemuk howard gardner. *Sustainable Jurnal Kajian Mutu Pendidikan*, 2(2), 176–197. <https://doi.org/10.32923/kjimp.v2i2.987>
- Talakua, M. M., & Takaria, J. (2022). Efektivitas Model Colaborative Problem Solving (Cps) Dalam Meningkatkan Self Concept Sains Mahasiswa Calon Guru Sekolah Dasar. *Jurnal Studi Islam*, 9(1), 28–42. <http://dx.doi.org/10.33477/jsi.v9i1.2050>
- Yohanes, R. S. (2010). Teori Vygotsky dan implikasinya terhadap pembelajaran matematika. *Widya Warta*, 34(02).