



## Examining Instructional Models in Enhancing 4C Skills among Primary School Students

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### Abstract

21st-century education requires the development of 4C skills as essential competencies for elementary school students. This study aims to identify and analyze the learning models used by teachers and to examine their contribution to the development of critical thinking, creativity, communication, and collaboration skills. This research employed a qualitative method with a descriptive approach. The research subjects consisted of teachers and fourth- and fifth-grade students at elementary school, selected through purposive sampling. Data were collected through observation, in-depth interviews, and documentation. Data analysis was conducted using the interactive model of Miles and Huberman, which includes data reduction, data display, and conclusion drawing/verification, with validity ensured through source and method triangulation. The findings indicate that Cooperative Learning and Problem-Based Learning models contribute positively to the development of 4C skills, particularly in communication and collaboration. However, critical thinking and creativity skills still require further improvement. Additionally, challenges such as limited facilities and teachers' competencies in implementing 4C-based learning were identified. The implications of this study highlight the importance of enhancing teachers' pedagogical competence and providing adequate learning resources to optimize the implementation of 4C-based learning in elementary schools.

**Keywords:** Learning Models, 4C Skills, Elementary School, Active Learning

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## INTRODUCTION

21st century education demands a transformation of the learning paradigm that not only focuses on mastering content, but also on developing essential skills known as the 4Cs, namely critical thinking, creativity, communication, and collaboration (Makmuri & Harun, 2024). These four skills are an important foundation in forming students who are adaptive, innovative, and able to compete in the era of globalization and the industrial revolution 4.0. The development of 4C skills has high urgency because it is the initial phase of character formation and thinking skills of students (Sartini & Mulyono, 2022). Teachers as learning facilitators have a strategic role in choosing and implementing learning models that suit the needs of students. The selection of the right learning model will affect the quality of learning interactions and the achievement of student competencies (Widodo & Wardani, 2020).

The learning model used by teachers is a conceptual framework that describes a systematic procedure in organizing learning experiences to achieve certain learning goals (Dahlan et al., 2026). In the context of 4C skill development, the learning model must be able



to encourage students to be active, participatory, and involved in the higher-level thinking process. Several learning models such as Problem Based Learning, Project Based Learning, and Cooperative Learning are considered relevant in developing 4C skills because they provide opportunities for students to solve problems, work together, and communicate ideas effectively (Amroni et al., 2024). The implementation of this learning model requires teachers to design contextual, challenging, and meaningful learning (Dewi et al., 2025). In addition, the use of learning models must also be adjusted to the characteristics of elementary school students who are still at the stage of concrete operational development.

Many teachers still emphasize the achievement of the cognitive aspect solely through lecture and assignment methods, without integrating innovative and participatory learning models. This condition causes students to tend to be passive, less able to think critically, and minimal in expressing ideas and collaborating with peers (Jusrianto et al., 2025) (Angga, 2022). Therefore, teachers need to have adequate pedagogic competence in order to be able to implement the learning model optimally. Critical thinking, creativity, communication, and collaboration skills that must be possessed by students from an early age (Fajarwati & Rahmawati, 2025; Minsih et al., 2026). Critical thinking is related to students' ability to analyze, evaluate, and solve problems logically (Nisa et al., 2025). Creativity refers to the ability to generate innovative and original new ideas. Communication emphasizes the ability to convey ideas effectively, both verbally and in writing. Meanwhile, collaboration is related to the ability to work together in a group to achieve a common goal. These four skills cannot be developed optimally without the support of the right learning model (Esteban JR et al., 2023).

Several studies that examine the effectiveness of critical thinking, creativity, communication, and collaboration learning models such as Qodri et al. (2025) explain that the Collaborative Inquiry learning model is effective in improving students' 4C skills, with an increase of 85% in critical thinking, 78% in communication, 82% in collaboration, and 74% in creativity, compared to traditional more passive lecture methods. Nisa et al., (2025) found that the problem-based collaborative learning model effectively improved students' critical thinking skills with an average n-gain score of 79.3% and was quite effective in improving collaborative skills with an average n-gain score of 72.3%. Dahlan et al. (2026) show that 4C skills can be developed effectively through active learning models such as Project-Based Learning, Problem-Based Learning, and Collaborative Learning, significantly enhancing students' critical thinking, creativity, cooperation, and confidence in a supportive school environment.

Most previous research has focused primarily on testing the effectiveness of a single learning model in a specific classroom setting, with limited attention to the various models teachers actually use in elementary school practice. The literature has not provided a comprehensive understanding of how various learning models are contextually implemented by teachers to foster critical thinking, creativity, communication, and collaboration. Furthermore, learning outcomes have paid little attention to the pedagogical processes, classroom realities, and contextual constraints that influence the successful development of the 4C skills. There is a significant gap between theoretical recommendations regarding student-centered learning and the actual implementation of this approach in elementary school classrooms, where traditional lecture-based instruction remains dominant. Therefore, the novelty of this study lies in its attempt to empirically test various learning models implemented by elementary school teachers, to explore how these models relate to students' 4C skill development, and to identify contextual challenges that shape their implementation in real classroom settings.

This study aims to analyze the instructional models employed by primary school teachers and to examine their contribution to the development of students' 4C skills, namely critical thinking, creativity, communication, and collaboration. More specifically, the study

seeks to answer three main questions: what instructional models are used by teachers in primary school classrooms, how these models contribute to the enhancement of students' 4C skills, and what obstacles teachers encounter in implementing 4C-oriented learning. The significance of this research lies in both its theoretical and practical contributions. Theoretically, it enriches the existing discourse on 21st-century learning by providing a more contextual and comprehensive understanding of the relationship between instructional models and 4C skill development at the primary school level. Practically, the findings are expected to offer valuable insights for teachers, school leaders, and policymakers in designing and supporting more effective, participatory, and student-centered learning practices. Furthermore, this study may serve as an empirical reference for future educational research and as a foundation for developing professional development programs that strengthen teachers' pedagogical competence in implementing innovative instructional models to foster students' 4C skills.

## **RESEARCH METHOD**

This study employed a qualitative research method with a descriptive approach to obtain an in-depth understanding of the instructional models used by teachers in developing 4C skills among elementary school students (Asrulla et al., 2023). A qualitative descriptive design was considered appropriate because it allows researchers to explore educational phenomena contextually and to describe classroom realities based on naturally occurring conditions in the field. The focus of this study was to examine how teachers implemented instructional models that support the development of critical thinking, creativity, communication, and collaboration in elementary school learning. Through this approach, the researcher was able to capture not only the types of instructional models used, but also the processes, interactions, and challenges experienced during their implementation in classroom practice.

The research was conducted at SD Inpres Mahambala, East Nusa Tenggara, Indonesia. The participants consisted of three classroom teachers and 30 students from Grades IV and V, aged between 10 and 12 years, who were selected purposively based on the needs of the study. These grade levels were chosen because they were considered to have implemented learning activities that potentially support the development of 4C skills. In qualitative research, the researcher acted as the primary instrument (human instrument), supported by several data collection instruments, namely observation guidelines, interview guidelines, and documentation sheets. Observation was used to examine the teaching and learning process directly, particularly the instructional models applied by teachers and students' participation during learning activities. In-depth interviews were conducted with teachers to explore their understanding, implementation, and challenges related to 4C-oriented learning models. Documentation was used to complement the data through the analysis of lesson plans, teaching modules, and examples of students' learning outcomes relevant to the implementation of 4C-based learning.

Data were collected through classroom observations, in-depth interviews, and documentation studies in order to obtain comprehensive and credible information. The collected data were then analyzed using the interactive qualitative data analysis model proposed by Miles and Huberman, which consists of three main stages: data reduction, data display, and conclusion drawing/verification (Azwar & Jayadi, 2025). Data reduction was carried out by selecting, categorizing, and focusing the data relevant to the research objectives, while data display was presented in the form of descriptive narratives to facilitate interpretation of the findings. The final stage involved drawing conclusions and verifying them continuously based on patterns, themes, and relationships emerging from the field data. To ensure the trustworthiness of the findings, this study applied source triangulation and method triangulation by comparing information obtained from observations, interviews, and

documentation. Through these procedures, the study sought to provide an accurate, contextual, and in-depth account of the instructional models used by teachers in fostering students' 4C skills in elementary school.

## **FINDINGS AND DISCUSSION**

### **Learning Model with 4C Skill Development in Elementary School**

The results of the research at SD Inpres Mahambala East Nusa Tenggara show that teachers have implemented several learning models that are oriented towards the development of 4C skills, although they are not fully optimal. The most dominant learning models used are Cooperative Learning and Problem Based Learning which are applied through group discussion activities, simple problem solving, and presentation of student work. In practice, teachers try to relate learning materials to the context of students' daily lives, so that learning becomes more meaningful. However, based on the results of observations, there is still a tendency for teachers to return to using the lecture method in the early and final stages of learning. This shows that the implementation of innovative learning models is still in the transition stage from conventional learning to more active and participatory learning. The results of the interview with the teacher are as follows;

"In learning, I usually use group discussions so that students can exchange opinions and learn to work together, although sometimes I still have to direct them because I am not used to it." (GK V)

"In several lessons, I ask students to solve simple problems related to their daily lives, for example problems about the school environment or activities at home. Through this activity, students can learn to think, express their ideas, and find solutions together, although they still need guidance in explaining their opinions clearly." (GK IV)

"I often divide students into small groups and ask them to present the results of their discussions in front of the class. This activity helps students become more confident in speaking and teaches them to listen to their friends' opinions, but some students are still shy and not all group members are actively involved in the discussion." (GK VI)

Based on the excerpt of the interview, it can be interpreted that teachers have tried to implement a learning model that is oriented towards the development of collaboration and communication skills through group discussions. This shows the pedagogical awareness of teachers in creating active and participatory learning. However, the statement that students "still have to be directed because they are not used to it" indicates that the 4C's skills, especially collaboration, have not been developed optimally and still require intensive mentoring.

The instructional practices implemented at SD Inpres Mahambala reflect an initial shift toward 21st-century learning, particularly in the integration of learning models that support the development of students' 4C skills. The use of Cooperative Learning and Problem-Based Learning suggests that teachers have begun to move beyond purely teacher-centered instruction by providing opportunities for students to discuss, solve contextual problems, and present their ideas in front of peers. These activities potentially contribute to the improvement of collaboration, communication, and critical thinking skills, while also creating a more meaningful learning experience through the connection of lesson content with students' daily lives. Nevertheless, the findings also reveal that the implementation of these models has not yet been carried out consistently and comprehensively. The continued reliance on lecture methods at the beginning and end of the lesson indicates that the

transformation toward student-centered learning is still partial. Therefore, the results can be generalized as showing that the development of 4C skills in elementary schools is strongly influenced not only by the selection of appropriate instructional models, but also by the consistency, depth, and quality of their implementation in classroom practice.

From the researcher's perspective, these findings demonstrate that the teachers' efforts to integrate discussion-based and problem-oriented learning represent a positive pedagogical response to the demands of 21st-century education. The teachers appear to understand the importance of creating classroom activities that encourage students to interact, share opinions, and work collaboratively. However, the fact that students still require substantial guidance during group work indicates that the implementation of 4C-oriented learning is still at an early developmental stage. This may be caused by several interconnected factors, such as students' limited prior experience with collaborative learning, teachers' varying levels of confidence and competence in managing active learning, and the persistence of conventional teaching habits that prioritize content delivery over student inquiry. In this context, the use of Cooperative Learning and Problem-Based Learning should not merely be understood as a change in teaching technique, but as part of a broader pedagogical transformation that requires continuous teacher support, reflective practice, and classroom adaptation. Thus, the effectiveness of these instructional models depends not only on their use, but also on how well teachers scaffold students' participation and gradually build a classroom culture that supports the development of 4C skills (see Table 1).

**Table 1. Indicators of 4C Skill Development in Elementary School Learning**

<b>4C Skill</b>	<b>Indicators</b>	<b>Evidence from Findings</b>
Critical Thinking	Identifying simple problems, analyzing information, and providing reasons for answers	Students were involved in solving contextual problems related to daily life, although many still required teacher guidance in explaining their opinions and drawing conclusions.
Creativity	Generating ideas, expressing opinions in their own way, and proposing simple solutions	Students began to contribute ideas during discussions and problem-solving activities, but their responses were still often influenced by teacher examples and guidance.
Communication	Expressing opinions, presenting discussion results, and responding to peers' ideas	Students participated in group discussions and presented their work in front of the class, showing growing confidence in speaking and sharing ideas.
Collaboration	Working in groups, sharing tasks, and respecting others' opinions	Students worked together in small groups, exchanged opinions, and completed tasks collaboratively, although some still needed direction to participate actively.

The learning models implemented at SD Inpres Mahambala have contributed to the development of students' 4C skills, particularly in the areas of collaboration, communication, and critical thinking. The application of Cooperative Learning and Problem-Based Learning has provided students with opportunities to participate actively in learning, exchange ideas, and engage in contextual problem-solving activities. However, the implementation of these models has not yet reached an optimal level, as teachers still combine them with conventional lecture methods and students continue to require intensive direction during collaborative activities. This indicates that while the school has initiated a transition toward more active and participatory learning, further efforts are needed to strengthen the consistency and effectiveness of 4C-based instruction. Therefore, improving teacher pedagogical competence, increasing familiarity with innovative learning models, and fostering students' readiness to engage in collaborative learning are essential steps to maximize the development of 4C skills in elementary school classrooms.

## Development of 4C Skills

The development of 4C skills (critical thinking, creativity, communication, and collaboration) in students at SD Inpres Mahambala NTT showed a significant increase after teachers implemented a more active and participatory learning model. Based on the results of observations in grades IV and V, students began to be able to express their opinions simply when given contextual problems related to daily life. Critical thinking skills can be seen from students' ability to answer analytical questions and try to give reasons for the answers they submit. In addition, the creativity aspect also begins to develop when students are given simple project-based tasks, such as making posters or composing stories based on their experiences. This shows that learning that provides space for exploration can encourage students to think more openly and innovatively. The interaction between students and teachers is as shown in Figure 2.



**Figure 2. 4c Learning Interactions**

Students' communication and collaboration skills have also developed quite well. Based on the results of interviews with teachers, students who previously tended to be passive began to dare to speak in front of the class, both in presentation activities and group discussions. In group work activities, students are seen to be more active in interacting, sharing tasks, and helping each other in completing the assigned tasks. This shows that the application of a collaborative learning model is able to create a more communicative and interactive learning environment. However, there are still some students who lack confidence in expressing their opinions, so they need further assistance from teachers. Therefore, the role of teachers as facilitators is very important in building a safe learning atmosphere and supporting students' active participation. The results of the interviews related to the use of the 4C learning model for teachers are as follows;

"Since I started using the group-based learning model and discussion, I have seen quite significant changes in students. They become more courageous to express their opinions, cooperate with each other, and not just wait for explanations from teachers. Their critical thinking skills also begin to show when they try to answer questions with logical reasons. Indeed, not all students are active, but in general this learning model is quite effective in helping to develop 4C skills in the students in my class."

**Table 2. Learning Model Used**

No	Models	4C Skills	Implementation	Challenge
1	Cooperative Learning	Communication dan Collaboration	Students discuss and work together in groups to complete learning tasks	Some students are still passive in group discussions
2	Problem-Based Learning (PBL)	Critical Thinking, Communication, dan Collaboration	Students solve contextual problems and present the results of the discussion	Students' critical thinking skills still need to be improved
3	Project-Based Learning (PjBL)	Creativity, Collaboration, dan Communication	Students create simple projects in groups according to the learning material	Limited learning facilities and media
4	Group Discussions	Communication dan Critical Thinking	Students exchange opinions and give feedback on learning materials	Not all students actively convey ideas
5	Group Presentations	Communication dan Creativity	Students present the results of the group work in front of the class	Students' confidence and speaking ability are still low

The results of interviews and presentations in the table show that the application of the group-based learning model and discussion has a significant effectiveness in developing 4C skills in students (see Table 2). This can be seen from the change in student learning behavior that has become more active, especially in the aspect of communication and collaboration, where students begin to dare to express their opinions and are able to cooperate with their peers. In addition, the emergence of students' ability to give logical reasons for the answers submitted shows a development in the critical thinking aspect. The teacher's statement also indicates that learning is no longer teacher-centered, but has shifted to student-centered learning that provides space for students to actively engage in the learning process.

So the results of this study show that there are several obstacles in the development of 4C skills at SD Inpres Mahambala NTT. Limited facilities and infrastructure, such as minimal learning media, are one of the factors that hinder the optimization of 4C-based learning. In addition, not all teachers have a deep understanding of the implementation of innovative learning models, so their implementation has not been consistent in every classroom. Nonetheless, in general, the implementation of the student-oriented learning model has had a positive impact on the development of 4C skills. Therefore, efforts are needed to improve teacher competence through training and the provision of supporting facilities so that the development of 4C skills can take place more optimally and sustainably.

## Discussion

From the aspect of developing 4C skills, it was found that students' collaboration and communication skills are relatively more developed compared to critical thinking and creativity. This can be seen from the ability of students to work together in groups and convey the results of discussions in front of the class with enough confidence. However, in the aspect of critical thinking, most students still have difficulty in analyzing problems in depth and providing logical arguments. Similarly, in the aspect of creativity, students tend to follow the example given by the teacher and are not fully able to generate new ideas independently (Hartanti et al., 2026; Suwarno & Masduki, 2024). This condition is influenced by learning patterns that have not fully provided space for exploration and freedom of thought for students. The effectiveness of the learning model is highly dependent on the teacher's competence in designing and managing learning innovatively. The limited understanding of teachers of 4C-based learning strategies and the limitations of supporting facilities are challenges in its implementation at SD Inpres Mahambala. Therefore, efforts are needed to improve teacher competence through continuous training and mentoring so that the learning model applied can be more optimal in developing students' 4C skills in elementary

school.

The results of this study show that the Cooperative Learning and Problem-Based Learning models used by elementary school teachers contribute positively to integrating 4C skills in the learning process, especially in the aspects of communication and collaboration through discussion activities, group work, and contextual problem solving. These findings are in line with research (Sembodo, 2021) stating that Cooperative Learning is able to improve students' communication and social interaction skills, research (Hidajat, 2023) found that Problem-Based Learning is effective in developing students' collaboration and critical thinking skills, and research (Effendi et al., 2024) explained that the integration of 4C skills in learning is greatly influenced by teacher competence and the availability of learning facilities. However, this study also found that students' critical thinking and creativity skills still need to be improved due to limited facilities and the lack of optimal implementation of 4C-based learning in elementary schools.

The development of 4C skills does not occur in a balanced manner, but rather follows the pattern of learning experiences most frequently provided by teachers in the classroom. Communication and collaboration appear more visible because students are regularly involved in discussion, group work, and class presentations, all of which directly train them to express ideas, listen to peers, and complete tasks collectively (Aini et al., 2021; Brink et al., 2021; Samara et al., 2024). By contrast, critical thinking and creativity require more complex instructional stimulation, such as opportunities to investigate open-ended problems, compare multiple perspectives, generate alternative solutions, and produce original work (Ismail et al., 2022; Rohimah et al., 2024; Zain et al., 2022). In the observed classrooms, these opportunities were still relatively limited because learning activities were often structured around teacher guidance and predetermined answers. As a result, students tended to focus on completing tasks correctly rather than exploring ideas independently. This finding suggests that the frequency and quality of participatory activities alone are not sufficient to develop all dimensions of 4C skills equally; rather, each dimension requires a specific pedagogical design that deliberately encourages inquiry, reflection, experimentation, and originality.

These findings also reinforce the view that the success of 4C-oriented learning is shaped by the interaction between instructional models, teacher readiness, and classroom context. Although Cooperative Learning and Problem-Based Learning have strong theoretical potential to support 21st-century skills, their impact in practice depends on how far teachers are able to transform them into meaningful classroom experiences (Ampadu et al., 2024; Damayanti & Farihah, 2023; Dewi & Rahayu, 2023). Teachers had shown an awareness of student-centered learning, but the implementation was still constrained by limited facilities, uneven mastery of innovative teaching strategies, and students' dependence on teacher direction (Ataman & Safitri, 2024; Javed, 2023). This condition is consistent with previous studies showing that the implementation of 4C-based learning in elementary schools often faces practical barriers, particularly in rural or resource-limited settings, where teachers must balance curriculum demands, classroom management, and the diverse learning needs of students. Therefore, the findings of this study should not be interpreted as indicating the ineffectiveness of Cooperative Learning or Problem-Based Learning, but rather as demonstrating that the pedagogical transformation toward 4C-based learning requires a gradual process, institutional support, and sustained professional development for teachers.

From a practical perspective, this study implies that improving students' 4C skills in elementary school should be approached as a comprehensive school effort rather than merely the selection of a particular instructional model. Teachers need support not only in understanding the concepts of 4C skills, but also in translating them into lesson planning, classroom activities, assessment strategies, and reflective teaching practices (Hagedoorn et

al., 2025; Stumbrienė et al., 2024). Schools also need to provide learning environments that encourage student participation, exploration, and creativity through adequate facilities, relevant learning media, and collaborative professional learning opportunities for teachers. In addition, the findings indicate the importance of designing age-appropriate scaffolding for elementary school students, so that they can gradually move from guided participation toward more independent problem solving, idea generation, and collaborative inquiry. In this sense, the contribution of this study lies in highlighting that the development of 4C skills in elementary schools is not only a matter of adopting innovative learning models, but also of building a supportive pedagogical ecosystem in which teachers, students, and school structures work together to sustain meaningful 21st-century learning.

## CONCLUSION

The learning model used by teachers, especially Cooperative Learning and Problem Based Learning, has made a positive contribution to developing students' 4C skills, even though the implementation is not fully optimal. Communication and collaboration skills show more dominant development compared to critical thinking and creativity, which still need to be strengthened through more innovative and exploratory learning strategies. The shift from teacher-centered learning to student-centered learning is beginning to be seen, marked by increased student activity in discussions and group work. However, the limitations of infrastructure facilities and teachers' competence in implementing the 4C-based learning model are challenges that need to be overcome. Therefore, the success of 4C skill development is highly dependent on teachers' ability to design creative, contextual, and student-centered learning. This research has several limitations, including that the research was only conducted in one elementary school, namely SD Inpres Mahambala, so that the results of the research could not be generalized to all elementary school contexts. In addition, this study uses a qualitative descriptive approach so that the findings obtained focus more on the overview of the implementation of the learning model and have not quantitatively measured the level of effectiveness of each model in developing students' 4C skills. Another limitation lies in the limited number of participants in teachers and students of grades IV and V, as well as the relatively short research time so that the process of integrating 4C skills cannot be observed in depth and continuously. Therefore, it is recommended to examine in more depth the effectiveness of each learning model in developing 4C skills by using a quantitative approach or mixed methods in order to obtain more comprehensive and measurable results.

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