The Role of Natural Schools in Cultivating 4C Skills to Face the Challenges of the 21st Century

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Abstract: The research uses a qualitative type with descriptive analysis methods: data collection techniques using interviews, observation, and documentation. The research results show that the cultivation of 4C skills is carried out through learning and school programs. Learning at nature schools uses a learning method: Learning with Nature (BBA). Through BBA learning, students are invited to identify problems and conclude problems related to learning. Students are also invited to form groups independently, divide tasks, work creatively, and communicate group work results. Instilling scientific literacy and 4C skills is also done through programs outside of learning. The planned programs include super camps, educational visits/trips, trading agricultural products, and Alek Minangkabau. The results of this research are the basis for conducting studies on instilling and improving 4C skills in elementary schools.

Keywords: 4C Skills; Natural School; 21st Century Challenges

Introduction

4C Skills (communication, collaboration, critical thinking, and creativity) are essential for student school foundation in the 21st century (Bayley, 2022). These skills help face change and increase life complexity because they help students think critically, work together, and share ideas with others. These 4C skills help students become creative, independent, and prepared to face global challenges (Novit et al., 2023). Students with 4C skills have more academic abilities and are ready to enter the world of work. The importance of these 4C skills is that the first student capable of thinking critically, evaluating information, building arguments, making decisions, and solving problems as well as becoming more independent (Paulus & Elder, 2006; Altun & Yildirim, 2023; Sosu, 2013; Yüce, 2023). Second, students can effectively convey their ideas to develop reasoning and creative thinking. (Alhaddad et al., 2015; Pramusinta & Dewi, 2023). Third, students can collaborate in making decisions and solving problems to achieve common goals (Care et al., 2016; Johnson &

Johnson, 2009; Li et al., 2023). Fourth, students can think outside the box, look at different angles, and create unique solutions.

Global problems arise, such as competition in the global economy, the Revolution Industry 4.0, and the challenging environment, demanding individual skills to compete And contribute effectively. Quantitative data shows that the inability to develop 4C skills at school can significantly impact the period for individuals and the public. Studies conducted by the World Economic Forum (2020) show that almost 50% of existing jobs will experience significant changes in matter demands and skills in 2025. Change shows the importance of thinking, communication, collaboration, and creativity skills for facing challenges. Besides that, the UN report (2019) highlights the necessity for the young generation to have collaboration skills and creativity to overcome increasing environmental problems. Because of that, understanding and developing 4C skills at a school-based level prepare generations to face complex global problems and be sustainable.

However, the data shows a severe problem in development skills among them on a school basis in Indonesia. Based on the report Body Center Statistics (BPS) Indonesia in 2019, the literate letter student school base reached 96.99%. Although the number of literate letters is high enough, education about 4C skills still needs improvement. Results show that system schools must respond to demands and challenge the 21st century (Santos-Meneses & Drugova, 2023). Other research shows that elementary school students ' 4C skills are on category low, with a level of critical and creative (Novit et al., 2023). The low-level 4C is visible in the collaborative moment of learning, thinking critically about problems, communicating, and creatively creating things. The inability of students to disclose their desires and feelings and actualize themselves with what he has can become a problem for students (Almarzooq et al., 2020). That's the problem developing 4C skills in school basics in Indonesia requires attention and severe and appropriate action. Learning must adapt to the demands of the 21st century with embedded required skills like 4C skills (Anggraeni et al., 2023).

The inability to overcome problem 4C skills can seriously impact an individual. In context education, a lack of 4C skills can hinder the ability to understand and analyze information critically, inhibiting the ability to study independently and influence academic performance (Paul & Elder, 2006). In place work, skills communication and weak collaboration can cause inefficiency in productivity and decision-making (Johnson & Johnson, 2009). This problem can also impact society and the economy, remembering that individuals with good 4C skills have more access to the good-to-opportunity economy and society. Because that's an effort to overcome problems, very 4C skills are essential for increasing quality education, productivity, power work, and equality in public.

Teachers must apply various approaches and methods to support learning in the 21st century in developing 4C capabilities (Al-Rahmi et al., 2022; Bray et al., 2023). Natural School offers an environment more oriented on experience interaction with nature, encourage practical communication skills, and gives students not quite enough answers in the learning process (Rickinson et al., 2004). This matter creates an opportunity for students to develop critical thinking skills, communication, collaboration, and creativity in life daily. Research conducted (Gass & Garvey, 2008) shows that Natural School can help students develop critical thinking skills and communication. Because often faced with the situation requires a solution problem And effective communication. Besides that, the natural environment offers various possible opportunities for students to develop 4C skills holistically. First, students are pushed to think critically in observing, analyzing, and exploring various natural

phenomena through exploring nature, improving ability solution problems (Chawla, 1998). Second, the natural environment gives a chance to communicate with Good with fellow students in real situations, face challenges, and share experience, strengthening communication skills (Rickinson et al., 2004). Third, a deep environment often requires the same team to work, and students can develop skills and essential collaboration in facing complex problems (Louv, 2006; Chawla, 1998; Louv, 2006). Lastly, nature gives inspiration not limited to creativity, fine in art, science, or solution problem environment (Eisner, 2002). With So, school naturally gives context experience to facilitate the development 4C skills whole.

Students can have these 4C skills if teachers can design and develop learning or curriculum that includes discussions, critical thinking activities, and reflection. (Correia et al., 2010) . This activity facilitates students to collaborate, communicate, and think critically in every learning process. Learning practices like this can be found in natural schools. A natural school is learning by doing, where students are directly involved in activities and observe actual events related to the material while being given free opportunities to explore (Setiani et al., 2021).
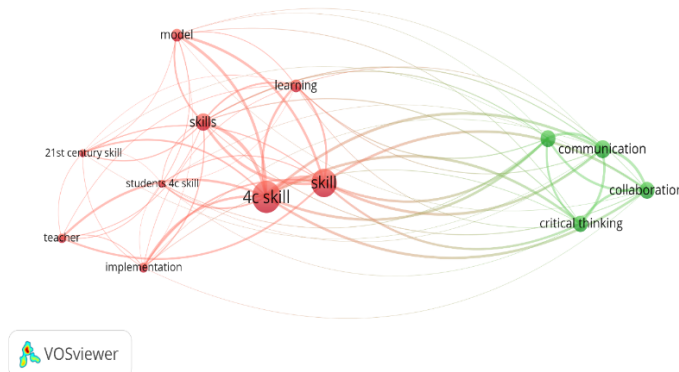

Figure 1. VOSviewer analysis

The results of analysis using VOSviewer software with Scopus and Google Scholar databases from previous research over the last ten years can be seen in Figure 1. This figure shows a research gap related to 4C skills, namely the cultivation of 4C skills in Natural Schools. Therefore, this research aims to find patterns of instilling 4C skills in natural schools to face the challenges of the 21st century. These cultivation patterns can later be used as a reference in cultivating 4C skills in elementary schools.

Method

This research is qualitative (Creswell, 2014). Qualitative research is appropriate to explain and understand the patterns of instilling 4C skills at the Nature School. The method used in this research is the

descriptive analysis method. The chosen research focus is 4C Skills at Natural Schools in West Sumatra. The data was analyzed and reduced to reconstruct the patterns of 4C skill cultivation at the Nature School.

This qualitative research will go through two stages of data collection, both primary data and secondary data. Preliminary data will be obtained through interviews with selected informants, while secondary data will be accepted through observation and document data. Observations are carried out by observing ongoing learning, and document data comes from curriculum documents and learning tools.

The data obtained was checked for data validity using triangulation and then analyzed. Source triangulation was carried out by comparing data from various sources (school principals, teachers, and students), and technical triangulation was done by comparing data from interviews, observations, and documentation. The data analysis carried out in this research is as follows (Ridder et al., 2018).

a. Data collection

The research data collected was obtained from interviews, observations, and documentation.

b. Data reduction

The data that has been collected is then reduced by selecting data that is closely related to the research focus. Data reduction is carried out in the following steps: a) data identification, b) data classification, and c) data coding.

c. Data display

Data presentation is done by displaying the reduced data in a table adjusted to the research focus. This data is presented to make it easier to analyze the data to formulate conclusions.

d. Conclusion

Conclusions are made and verified by comparing the data in field notes, data reduction, and data presentation. Conclusions are drawn according to the following Figure 2.
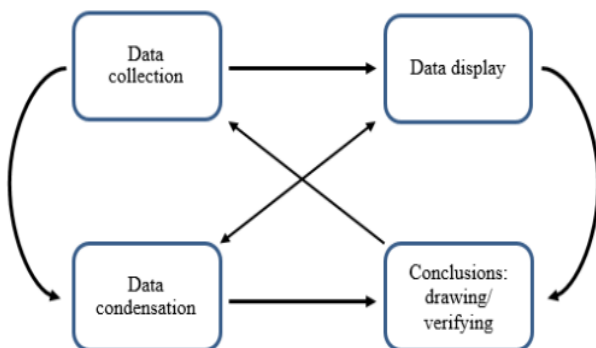
Figure 2. Interactive Model Data Analysis (Miles et al., 2014)

Result and Discussion

The outline of the planting of 4C in natural schools can be seen in the Figure 3.
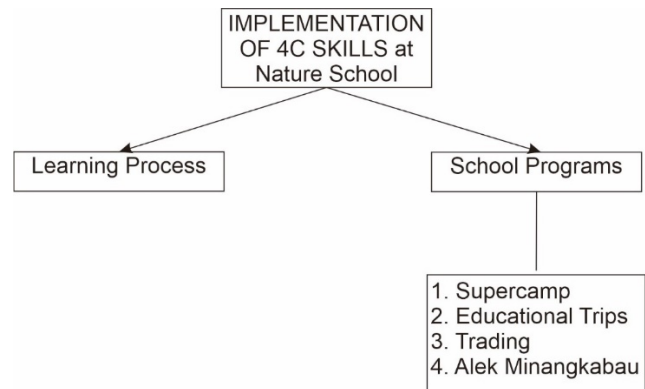
Figure 3. 4C Skills Cultivation Process

A more detailed discussion regarding the cultivation of these skills is as follows.

a. Planting through learning activities

The findings reveal that learning in natural schools is carried out by integrating nature around the school. Students can interact with their environment through the school curriculum's Learning with Nature (BBA) method. The BBA concept starts with Learning in Nature, Learning in Nature, and finally, Learning with Nature. The BBA is learning to use the potential of natural resources, respecting local wisdom, and learning by exploring, experimenting, and going on field trips. This ideal condition will support the cultivation of 4C in elementary schools, because the obstacle factors as stated by Selman & Jaedun (2020) are not found in learning with BBA, such as a lack of open materials and classes that are not conducive.

Learning in BBA integrates nature and the surrounding environment as key elements in the learning process. This method provides students with real experience in understanding and appreciating the complexity of natural ecosystems and developing deep ecological awareness. In this context, nature is not just a learning background but a living source of knowledge that can be integrated into the academic curriculum. Students can experience natural phenomena, identify ecological relationships, and address real environmental problems by directly exploring nature or their school environment.

Learning with the potential of natural resources means that the environment and surroundings of the school are used as a resource for learning. Students will study the potential and problems that are appropriate to the characteristics of their environment. Therefore, in BBA, students are invited to appreciate local wisdom and are invited to preserve it. For example, students

explore local wisdom, such as language, clothing, traditional houses, local food, arts, and ways of life.

During learning with BBA, students are invited to explore and experiment. BBA is also carried out using outing classes or field trips, namely learning directly from experts by visiting them in person if the surrounding environment needs to be more supportive. The Minangkabau Nature School teacher, in his interview, explained that an example of implementing Learning with Nature is, for example, when the school is in an urban environment, children will be taken to the beach area to learn about the environment in the beach area. So that students have experience from an environment far from their own. The destination of the outing can vary depending on the material being studied.

This learning aims to form skills and character, especially leadership and caring for the environment. Study results also show that students experience changes in behavior caused by their involvement in learning activities (O'Brien & Murray, 2007). This change is because Learning with Nature allows students to express and explore according to their character. Therefore, the class format is open, indicating that learning is not only in the classroom; students are free to explore the surrounding environment in learning. The results of interviews with school principals also confirm this:

"The classroom construction was deliberately built open with lots of windows so that students feel free to explore and do not feel trapped in the classroom, like the proverbial frog in its shell."

The class design can be seen in Figure 4.

Figure 4. Form of Class Building

The Learning with Nature method is a learning used to cultivate 4C skills. Learning in natural schools using this method allows students to improve critical thinking, collaboration, communication, and creativity. Critical thinking is done by inviting students to collect, identify, and conclude several problems related to the

study material. After that, students are also invited to search, sort, and interpret information related to the problem. With the various pieces of information obtainable, students are invited to solve problems. The teacher explained in his interview that provoking critical thinking skills was done by asking children questions and giving children the freedom to give opinions or answers. Apart from that, give them problems close to the students' environment; then, students are invited to respond and provide solutions from the students' point of view.

Collaboration skills can be seen when the teacher invites them to form discussion groups independently, agrees on the division of tasks, and takes responsibility for the tasks of each group member that have been previously agreed upon. In group work, students are invited to help each other encourage and respect fellow group members students' collaboration and discussion activities, group work, and class projects. Aeni's research (2023) results added that collaborative cultivating can be through classroom project activities such as short theater.

Communication can be seen when the teacher asks students to formulate and express opinions/questions orally and in writing from individual or collaborative work results. Students present the results of their work/project from the process they carried out to the results. Presentations in this natural school are communicated to classmates, teachers, and the student's parents. Apart from that, the implementation of communication skills can also be seen when students explain the relationship between the material they have studied and what they will study, as well as the relationship between the material they will study and their daily life experiences.

The last 4C skill is creativity. Teachers instill creativity by providing a learning environment that can develop students' creativity by learning through experience (Dilekçi & Karatay, 2023). Teachers at natural schools increase students' creativity by inviting students to make opinions/questions with various formulations. Students are also encouraged to express opinions that differ from those of their classmates and develop opinions expressed by friends. Students are also invited to connect different opinions, conclude them into a complete idea, and convey the benefits of the material they have studied for everyday life. Sukardjo et al. (2023) added that in their research they stated that the most effective step in cultivating student creativity is through games. This is also what the teacher does, in the learning portion, students are encouraged to learn while playing. This explanation is reinforced by the student's statement as follows.

"I feel happy studying at this natural school, because we are invited to learn while playing. In games, we are often invited to look for problems and solve them

using information obtained from various sources. In working groups, we are allowed to form and divide tasks independently. When working in groups, we were also invited to be creative in group work, such as making reports in the form of posters."

b. Planting through Nature School programs

The 4C skills of elementary school students through learning using the Learning with Nature method are also supported by programs in natural schools. Programs related to 4C skills include supercamp, educational visits/trips, trading agricultural products, and Alek Minangkabau. By the description provided by the school principal:

"4C skills are also instilled through programs such as trading agricultural products, super camps, trips, or educational visits. One of the superior programs is supercamp. At this super camp, the activity lasts for three days; besides training students' independence, this activity is also a way to teach students natural thinking and 4C skills. Students are invited to be critical of their environment during supercamp. Students collaborate with their groups and communicate what they have learned. "Students are also invited to be creative during supercamp activities."

Supercamp is a structured and effective program for developing cognitive, social, and personal abilities. Activities in nature can improve students' learning outcomes and their potential to achieve learning goals (Roe & Aspinall, 2011). Cultivating 4C skills begins with getting to know the natural surroundings at the supercamp.

"This super camp is held in different places; this is done so that students get to know nature more and get used to solving problems or living with their environment." Explanation from the principal'

Students become familiar with the environment through supercamp activities in the natural environment and gain knowledge about natural phenomena. Children develop their critical thinking by increasing curiosity about unfamiliar things they find around them and are inspired to ask creative questions about these things (O'Brien & Murray, 2007). Communication skills are cultivated through group activities, discussions, and presentations, which help students improve their speaking and listening skills. Collaboration, encouraged through group assignments and joint projects, allows students to learn to work together, solve problems, and share ideas. Critical thinking is enhanced through providing intellectual challenges, problem analysis, and in-depth reflection provided during supercamp. Furthermore, creativity is formed through various activities that inspire students to think creatively to find unique solutions.

Apart from Supercamp, there is also a Trading Agricultural Products program. Trading Agricultural Products program is a program where students sell their gardening products. Students plant productive plants/plants, care for them, harvest them, process them, and sell the produce. Here, the teacher guides students from the beginning to the end. This program supports the creation of students' 4C skills. Students identify and get to know the plants to be planted with various considerations and exchange opinions with their friends. Gardening students collaborate with friends and teachers. After harvesting the fruit/products from the plants, students are invited to process the harvest for sale creatively. This creation can take the form of processed food in containers that do not come from plastic. From the embedding process to sales, students' 4C skills can improve. This is confirmed in research Saputri & Sukartono (2023) that in market day activities students learn to be creative and communicate.

Students are also invited to educational visits to increase knowledge they do not encounter or obtain in their school environment. Students learn directly from different sources and environments. An example is a visit to the West Sumatra Master Seed Center. This educational visit aims to introduce various ways of plant reproduction directly. Students are invited directly to carry out or practice artificial vegetative propagation such as grafting, cuttings, etc. This educational visit activity instills 4C skills because students observe and interact directly with problems in their natural surroundings. Another example of an educational visit is a visit to a museum. An open learning environment stimulates students to be more curious and willing to explore as a factor in developing critical thinking and creativity. By interacting with objects in the museum, museum managers and student teachers gain new experiences, thereby increasing their ability to generate new (Gong et al., 2020). The museum also provides hands-on workshops that effectively let kids engage with art, science, history, and culture. Students can release their imagination, experiment with new ideas, and develop their knowledge (Gregoriou, 2023).

Instilling 4C through educational visits is an essential approach to developing student skills. In terms of communication, students interact with various parties, including educators and peers, and facilitate understanding and conveying information. Students also work in groups and interact with students to achieve common goals during educational visits. Students are also encouraged to observe, analyze, and evaluate, and comunicate the information obtained during the visit to develop 4C skills. Through this educational visit, students are invited to see different ways of exploring and solving problems. This is supported by the research of Widiawati et al. (2018), who found that scientific approaches such as observing,

questioning, trying, affiliation, and communicating more effectively instil students' 4C skills.

Alek Minangkabau is an annual festival at this school whose main aim is so that everyone in the school ecosystem gets to know the regional culture, especially in this research, Minangkabau culture as a whole. Alek Mingkabau is an annual program at the Minangkabau Natural School. Students practiced for several weeks to prepare this Alek Minangkabau. Students are trained to collaborate and be creative during preparation for the Alek Minangkabau stage. Through this Minangkabau alek activity, skills such as communication are the main key. The younger generation is invited to communicate clearly and effectively through oral arts, literature, and folklore traditions. Students are invited to collaborate with parents, teachers, and friends at school to prepare for the day when the Minangkabau Alek is held. Students in collaboration are directed to commit to following guidelines to achieve common goals (Pardede, 2020). Students are also invited to solve social and cultural problems innovatively and wisely. Student creativity in this activity is highly emphasized and reflected in traditional Minangkabau arts and crafts, encouraging students to express themselves during the Alek Minangkabau event.

Conclusion

The planting of 4C is carried out in two ways, namely through learning and school programs. The Nature School in West Sumatra is planted through learning by teachers as facilitators. Teachers invite students to think critically and collaboratively by working in groups, communicating, and thinking creatively. The planting of 4C is also encouraged by aligning programs from elementary schools such as super camps, educational visits/trips, trading agricultural products, and Alek Minangkabau.

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