

**EFFORTS TO IMPROVE 4C SKILLS (*CRITICAL THINKING, COLLABORATIVE, COMMUNICATIVE, AND CREATIVE*) THROUGH *PROJECT-BASED LEARNING***

**<sup>1</sup>Neuwidia Nuzul Putri, <sup>2</sup>Kurnia Ningsih and <sup>3</sup>Sri Supartini**

<sup>1,2</sup>Tanjungpura University, Pontianak, Indonesia

<sup>3</sup>SMA Negeri 1 Pontianak, Indonesia

Email: kurnia.ningsih@fkip.untan.ac.id

DOI: 10.22373/biotik.v11i2.18326

**ABSTRACT**

Softskills in the form of 4C skills (critical thinking, creativity, communication, and collaborative) need to be equipped to students through strategies that can be used by educational institutions. The purpose of this study was to improve students' 4C skills by applying the Project Based Learning (PjBL) model. This type of research is Classroom Action Research (PTK). The classroom action research procedure was carried out with two cycles with two meetings in each cycle. This study used instruments in the form of observation sheets and written evaluation tests. Data collection techniques in this study include (1) observation, (2) tests, and (3) documentation. The results showed an increase in 4C skills through Project Based Learning (PjBL). Critical thinking skills at the end of cycle II increased by about 46.7% from 33.3% to 80%. Collaborative skills at the end of cycle II increased by about 20% from 66.7% to 86.7%. Communication skills at the end of cycle II increased by about 26.7% from 53.3% to 80%. Creative thinking skills at the end of cycle II increased by 40% from 46.7% to 86.7%. It is concluded that this research proves that 4C skills (critical thinking, collaborative, communicative, and creative) can be improved effectively by applying the Project Based Learning (PjBL) model.

**Keyword:** Skills, 4C, Project Based Learning.

**INTRODUCTION**

The 21st century is known as the highest demand is the demand to the industrial age and the knowledge produce quality human resources, in age, where all skills needed to fulfill this case, the demand to have skills. To needs in various ways are based on prepare the 21st century generation for knowledge. In the 21st century, the facing global demands and challenges,

it is equipped with 21st century learning, which, in this century, advances in technology and information have developed rapidly, including in the field of education [1]. Through education can equip students with the skills needed to have a quality future [3].

The 21st century has a major impact on education because, in the 21st century, learning does not only rely on knowledge but also requires skills. Skills in the 21st century are known as 4C skills, which include skills in critical thinking and problem solving, creativity and innovation, communication, and collaboration [3]. These skills are needed in 21st century education because they are in accordance with the concept that brings changes from traditional learning to modern learning so that students can have knowledge, learning skills, innovation and technology utilization skills, and life skills [1]. 4C skills are soft skills, which, in their implementation, are more useful than hard skills [4]. So, education has a big role to play in improving soft skills and

hard skills for an individual in the 21st century [21].

Critical thinking and problem-solving skills are the ability to be able to understand a problem that is associated with various information to bring up perspectives and solutions to a problem [9]. Critical thinking skills can be developed by students through learning in schools in order to face the demands and challenges of the 21st century. In the 21st century, critical thinking skills are very important in responding to changes that occur quickly and effectively. Therefore, critical thinking skills are interpreted as a high-level ability by using the material that has been learned in solving problems [12].

Creative and innovative thinking skills (creativity and innovation skills) are skills to be open and responsive in finding and conveying ideas and opinions to others [26]. According to Guilford, creative thinking has four characteristics, namely: the ability to generate ideas quickly (fluency of thinking), the ability to see problems from different points of view (flexibility), the ability

to develop ideas (elaboration), and the ability to find unique and original ideas (originality) [25].

Communication and collaboration skills are interrelated and difficult to separate. Communication and collaboration skills are the ability to express ideas to others and the ability to build cooperation with others [25]. Collaboration skills can change the learning model from teacher-centered learning to learning that involves teachers with students or students with students to exchange opinions [13]. The exchange of opinions involves communication skills, meaning that communication is one of the individual needs for social interaction in the environment [20].

Soft skills in the form of 4C skills (critical thinking, creativity, communication, and collaboration) need to be equipped for students through strategies that can be used by educational institutions. The improvement of 4C skills itself is very important to prepare for the future [19]; improve learning outcomes, and form skills according to what is needed in the 21st century [14]. Learning strategies can be integrated with 4C

skills through models that can develop critical thinking skills, train creativity, build collaboration, and train communication skills.

Project-based learning (PjBL) is a project-based learning model that can provide direct experience for students to enrich their understanding of theories and concepts [22]. In previous research, project-based learning has been shown to improve creative thinking skills [5]; [15], creativity [2], and learning outcomes [24]. The PjBL model is also one of the learning strategies that can create a creative, active, and independent learning atmosphere [24]. PjBL can direct students to solve real problems, provide fun learning, and become effective learners [23]. In biology subjects in high school, some materials can be implemented by creating their own work to facilitate students in building ideas and problem solving. Therefore, the PjBL model is considered effective for improving students' 4C skills as a provision for facing the challenges and demands of the 21st century.

Based on the above, researchers are interested in improving the 4C skills (critical thinking, creativity,

communication, and collaboration) of students because the 21st century requires soft skills, which are contained in the project-based learning (PjBL) model.

## **RESEARCH METHOD**

The type of research used is classroom action research (PTK) to improve 4C skills by applying the Project-Based Learning (PjBL) model. Through this research, teachers can improve their abilities and self-actualize so that the next learning process can be better and can improve students' skills.

According to Suryabrata (1983), action research is research with the aim of developing new skills, strategies, or approaches to solving a problem by applying them directly in the world of work or other actual worlds [16].

The classroom action research procedure was carried out in two cycles, with two meetings in each cycle. The initial data on students was obtained through the pre-cycle stage. The model used in this study was adopted from the Kurt Lewin model

using four stages of implementation, namely (1) planning, implementation, (3) observation, and (4) reflection [6]. The details of the research cycle conducted are as follows:

### 1) Cycle I

#### a. Planning

At this stage, the model that has been determined to be used is project-based learning. Next, compile and plan the project that will be given to students.

#### b. Implementation

At this stage, project-based learning is implemented. This process is an important part of classroom action research. Learners are divided into groups of 3 - 4 people. Each group will create a project with product differentiation. This means that each group has the freedom to produce different works as the final result.

#### c. Observation

Observers observed the collaborative, communicative, and creative thinking skills of students during the learning process with the project-based learning model.

#### d. Reflection

Examining the results of students' evaluation tests on critical thinking skill. Analyzing the results of observations to draw conclusions related to collaborative, communicative, and creative thinking skills in learning in the first cycle. Planning follow-up to take corrective action on the implementation of cycle I.

## 2) Cycle II

Cycle II is implemented in the same way as Cycle I. Each group will be given a project task with product differentiation. Learners are given time to design and create their own projects. Researchers will observe differences and improvements in the 4C skills of learners from the cycles that have been implemented.

This research was conducted on April 11 and 13, 2023, for cycle I, and on May 4 and 9, 2023, for cycle II by involving one observer to observe students' activities during learning. The subjects in this class action research were students at XJ class in the even semester at SMA Negeri 1 Pontianak in the 2022/2023 academic year. This study used instruments in the form of observation sheets and written

evaluation tests. The observation sheet used was an observation sheet for collaborative, communicative, and creative thinking skills. While the written evaluation test contains critical thinking skills with a total of 5 test questions in cycles I and II.

The material used in the implementation of class action research with project-based learning (PjBL) is ecosystem material. The stages carried out by students during learning with PjBL are: 1) determining fundamental questions; 2) designing project planning; 3) preparing a project schedule; 4) implementing the project; 5) testing the project results; and 6) evaluating the learning experience.

Data collection techniques in this study include (1) observation, (2) tests, and (3) documentation. Data collection techniques in action research are determined by the nature of the data to be collected [16]. The indicator of success that must be achieved in this action research in terms of learning evaluation test results in classical learning is if  $\geq 75\%$  of students get the minimum score.

## **RESULTS AND DISCUSSION**

Learners' critical thinking skills are measured by a written evaluation test. The questions given are in the form of written tests that present several problems, and students must be able to provide simple explanations, build basic skills, provide further explanations, develop strategies and tactics, and conclude. Learners' scores are calculated based on the acquisition score of possible answers made by learners.

Collaboration skills have indicators: 1) contributing to the group; 2) being helpful to fellow group members; 3) being flexible to the opinions of all members; 4) being able to respect individual differences; 5) being responsible; and 6) completing their tasks on time. Based on observations by researchers and observers, the collaboration skills of participants increased at the end of the cycle II. This is because students are in a new group environment, so the differences make students adapt and avoid their dependence on the same group.

Communication skills have six indicators: 1) conducting discussions; 2) working together in groups; 3) drawing conclusions; 4) presenting tasks well; 5) asking questions; and 6) responding to other groups' presentations. Students' communication skills improved at the end of cycle II. Based on the observations of researchers and observers, learners are increasingly active in expressing ideas and thoughts and dare to make presentations related to the work that has been done. In addition, learners also dared to ask opinions and questions to groups that were presenting.

Creative thinking skills have six indicators: 1) fluency; 2) flexibility; 3) originality; 4) elaboration; 5) metaphorical thinking; and 6) evaluative. Learners' creative thinking skills also increased at the end of cycle II.

Because learners are able to create unique and original works from each group through product differentiation. Learners can even explain the work they make with the right concept. A recapitulation of the

assessment results of the 4C skills (communication, and collaboration) can (critical thinking, creativity, be seen in the following table:

Table 1. Results of Recapitulation of 4C Skills Assessment of Learners

| No.     | Skills            | Pre Cycle | Cycle I | Cycle II |
|---------|-------------------|-----------|---------|----------|
| 1       | Critical thinking | 33,3      | 46,7    | 80,0     |
| 2       | Collaboration     | 66,7      | 73,3    | 86,7     |
| 3       | Communication     | 53,3      | 66,7    | 80,0     |
| 4       | Creative thinking | 46,7      | 66,7    | 86,7     |
| Total   |                   | 200       | 253,4   | 333,4    |
| Average |                   | 50        | 63,4    | 83,4     |

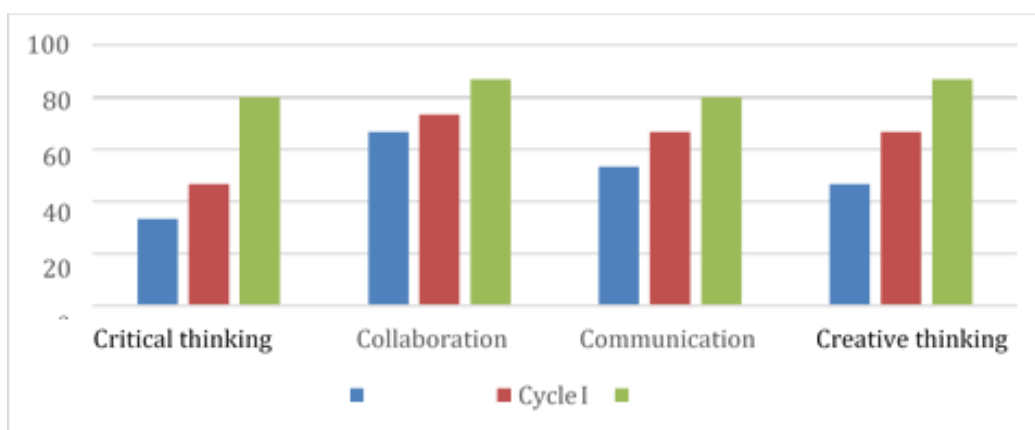


Figure 1. Results of the Recapitulation of the Assessment of 4C Skills of Learners

Based on the table and graph above, the 4C skills were seen to increase at the end of cycle II. Students' critical thinking skills increased by about 46.7%, from 33.3% to 80%. Critical thinking skills increase after using PjBL because the activities carried out by students in each learning stage train and hone students' thinking skills. According to Widiadnyana, Sadia, and Suastra, through participant-centered and learning that does not just

emphasize memorization but also problems can improve students' thinking skills [7]. Thus, the PjBL model applied in this action research is able to help students improve their thinking skills.

The collaborative skills of students increased by about 20%, from 66.7% to 86.7%. The increase in collaborative skills occurred because students in the learning process using PjBL were encouraged students to

collaborate through the six stages (syntax) contained in the PjBL model. The collaborative skills of students at the pre-cycle stage were already in the high category because students were used to working in groups but tended to be in the same group. Through the PjBL model, students are organized into new groups in each cycle so that students who are in groups can exchange thoughts and opinions, learn from each other, and provide explanations to other students who do not understand the material [8].

Learners' *communicative* skills increased by about 26.7%, from 53.3% to 80%. The increase in communication skills can be influenced by the collaborative activities of students in the learning process. Communication skills are effective for improving skills in problem solving and group activities in expressing ideas and opinions [10]. In PjBL learning, learners in groups try to solve problems through project designs that are designed so as to improve skills in communication and train them to empathize with the opinions expressed by other learners.

Creative thinking skills also increased by 40%, from 46.7% to

86.7%. Creative thinking skills cannot just appear immediately, but through exercises carried out by students as well as in designing and implementing projects through PjBL. The results of other studies reveal that the interaction that occurs between the learning models used affects the ability of students to engage in creative thinking and problem solving [18]. In addition, it can also be influenced by the freedom of learners to design projects with product differentiation so that they become more creative. Product differentiation makes learners have a broader understanding, provides a challenge for learners' creativity, and is a form of expression of the learning done by learners [17].



Figure 1. One of the Creative Products by Students



## CONCLUSION

Based on the results obtained from this study, it proves that 4C skills (*critical thinking, collaborative, communicative, and creative*) can be improved effectively by applying the *project-based learning* (PjBL) learning model because it can encourage students be active in learning, able to do problem solving, more creative, have empathy, and can work together in groups. The improvement of learners' 4C skills can be a provision to face the challenges and demands of the 21st century.

## REFERENCES

- [1]Agustinova, D.E., Sariyatu, Sutimin, L.A., & Purwanta, H. 2022. Urgensi Keterampilan 4C Abad ke-21 dalam Pembelajaran Sejarah. *SOCI: Jurnal Ilmu-ilmu Sosial*, 19(1): 49-60.
- [2]Ardianti, S.D., Pratiwi, I.A., & Kanzunudi, M. 2017. Implementasi Project Based Learning (PjBL) Berpendekatan Science Edutainment Terhadap Kreativitas Peserta Didik. *Refleksi Edukatika: Jurnal Ilmiah Kependidikan*, 7(2), 145-150.
- [3]Arianti, N. & Pramudita, D.A. 2022. Implementasi Pembelajaran Abad 21 Melalui Kerangka Community of Inquiry dengan Model Think Pair Share. *Jurnal Visi Ilmu Pendidikan*, 14(1): 65-73.
- [4]Arnyana, I.B.P. 2019. Pembelajaran Untuk Meningkatkan Kompetensi 4C (Communication, Collaboration, Critical Thinking, dan Creative Thinking) Untuk Menyongsong Era Abad 21. *Prosiding: Konferensi Nasional Matematika dan IPA Universitas PGRI Banyuwangi*, 1(1): 1-13.
- [5]Erisa, H., Hadiyanti, A.H.D., & Saptoru, A. 2021. Model Project Based Learning untuk Meningkatkan Kemampuan Berpikir Kreatif dan Hasil Belajar Siswa. *Jurnal Pendidikan Dasar UNJ*, 12(1): 1-11.
- [6]Farhana, H., Awiria, & Muttaqien, N. 2019. *Penelitian Tindakan*

Kelas. Medan: Harapan Cerdas.

Manusia. Lectura: *Jurnal Pendidikan*, 12(1): 29-40.

- [7]Hamdani, M., Prayitno, B.A. & Karyanto, P. 2019. Meningkatkan Kemampuan Berpikir Kritis Melalui Metode Eksperimen. *Proceeding Biology Education Conference*, 16(1).
- [8]Husain, R. 2020. Penerapan Model Kolaboratif dalam Pembelajaran di Sekolah Dasar. *Prosiding Webinar Magister Pendidikan Dasar Pascasarjana*. Universitas Negeri Gorontalo.
- [9]Indarta, Y., Jalinus, N., Waskito, Samala,A.D., Riyanda, A.R., & Adi, N.H. 2022. Relevansi Kurikulum Merdeka Belajar dengan Model Pembelajaran Abad 21 dalam Perkembangan Era Society 5.0. Edukatif: *Jurnal Ilmu Pendidikan*, 4(2): 3011-3024.
- [10]Makiyah, Y.S., Mahmudah, I.R., Sulistyaningsih, D., & Susanti, E. 2021. Hubungan Keterampilan Komunikasi Abad 21 dan Keterampilan Pemecahan Masalah Mahasiswa Pendidikan Fisika. *JoTaLP: Journal of Teaching and Learning Physics*, 6(1): 1-10.
- [11]Mardhiyah, R.F., Aldriani, S.N.F., Chitta, F., & Zulfikar, M.R. 2021. Pentingnya Keterampilan Belajar di Abad 21 sebagai Tuntutan dalam Pengembangan Sumber Daya
- [12]Marlina, W. & Jayanti, D. 2019. 4C dalam Pembelajaran Matematika untuk Menghadapi Era Revolusi Industri 4.0. *Prosiding Sendika*, 5(1), 392-396.
- [13]Mashudi. 2021. Pembelajaran Modern: Membekali Peserta Didik Keterampilan Abad Ke-21. Al-Mudarris: *Jurnal Ilmiah Pendidikan Islam*, 4(1): 93-114.
- [14] Meilani, D., Dantes, N., & Tika, I.N. 2020. Pengaruh Implementasi Pembelajaran Sainifik Berbasis Keterampilan Belajar Dan Berinovasi 4C Terhadap Hasil Belajar IPA Dengan Kovariabel Sikap Ilmiah Pada Peserta Didik Kelas V SD Gugus 15 Kecamatan Buleleng. *Jurnal Elementary: Kajian Teori dan Hasil Penelitian Pendidikan Sekolah Dasar*, 3(1): 1-5.
- [15]Mulyana, E., Juariah, Suherman, A., Widyanti,T., & Supriatna,A. 2022. Implementasi Model Project Based Learning Dalam Meningkatkan Kemampuan Berpikir Kreatif. Sosial Khatulistiwa: *Jurnal Pendidikan IPS*, 2(1): 25-32.
- [16]Nanda, I. et al. 2021. *Penelitian Tindakan Kelas Untuk Guru Inspiratif*. Indramayu: CV. Adanu Abimata.

- [17] Ningrum, M., Maghfiroh, & Andriani, R. 2023. Kurikulum Merdeka Belajar Pembelajaran Berdiferensiasi di Madrasah Ibtidaiyah. *eL Bidayah Journal of Islamic Elementary Education*, 5(1): 85-100.
- [18] Nisa, C. & Amalia, F. 2021. Perbedaan Kemampuan Berpikir Kreatif dan Kemampuan Pemahaman Konsep Matematika Siswa dengan Strategi Pembelajaran Kooperatif Tipe Co Op Co Op dan Teams Games Tournament (TGT). *JTMT: Jurnal Tadris Matematika*, 2(1): 9-18.
- [19] Partono, Wardhani, H.N., Setyowati, N.I., Tsalitsa, A., & Putri, S.N. 2021. Strategi Meningkatkan Kompetensi 4C (Critical Thinking, Creativity, Communication, & Collaborative). *Jurnal Penelitian Ilmu Pendidikan*, 14 (1): 41-52.
- [20] Pramudita, I.F.E., Praherdhiono, E., Adi, E.P. (2021). Studi Keterampilan Abad 21 Mahasiswa dalam Memilih Peminatan. *JKTP: Jurnal Kajian Teknologi Pendidikan*, 4(3): 233-328.
- [21] Rawung, W.H., Katuuk, D.A., Rotty, V.N.J., & Lengkong, J.S.J. 2021. Kurikulum dan Tantangan pada Abad 21. *Jurnal Bahana Manajemen Pendidikan*, 10(1): 29-34.
- [22] Sababha, B.H., Alqudah, Y.A., Abualbasal, A., & AlQaralleh, E.A. 2016. Project-Based Learning to Enhance Teaching Embedded Systems. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(9), 2575-2585.
- [23] Sahtoni, Suyatna, A., & Manurung, P. 2017. Implementation of Student's Worksheet Based on Project Based Learning (PjBL) to Foster Student's Creativity. *International Journal of Science and Applied Science: Conference Series*, 2(1): 329-337.
- [24] Simangunsong, H.H., Hrp, I.A.A., Azhari, N.S., Afdilani, N., & Tanjung, I.F. 2022. Penerapan Project Based Learning (PjBL) untuk Meningkatkan Hasil Belajar Siswa Kelas XII IPA 1 SMA N2 Percut Sei Tuan pada Materi Gen. *Jurnal PTK dan Pendidikan*, 8(2): 107-115.
- [25] Tamin, K.B., Ubadah, & Mashuri, S. 2022. Proceedings of Islamic Studies and Science Integration in the Era of Society 5.0 (KIIIES 5.0) Postgraduate Program of Datokarama State Islamic University Palu, 1.
- [26] Yusliani, E., Burhan, H. L., & Nafsih, N. Z. 2019. Analisa Integrasi Keterampilan Abad ke-21 Dalam Sajian Buku Teks Fisika SMA Kelas XII Semester 1. *Jurnal Eksakta Pendidikan (JEP)*, 3(2), 184- 191.