

Improving Students' Collaboration Skills Using the RADEC Learning Model in Elementary School Science Learning

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Abstract: The learning model has an influence on the success of achieving learning objectives. One of the learning models that can improve the skills of students is the RADEC learning model. The syntax contained in the RADEC learning model can help learner-centered learning, namely Read, Answer, Discuss, Explain and Create (RADEC). Currently, collaboration is one of the learning activities that is very popular with students, where currently collaboration skills are found in the 4C skills of the 21st century, however, there are still many students who are still passive in collaborative learning activities. Science and Technology is one of the lessons in the current independent curriculum. This research aims to improve collaboration skills in students using the RADEC learning model. This research uses a classroom action research (PTK) model which is carried out in two cycles consisting of four stages starting from planning, action, observation and reflection. The implementation of learning in this research was carried out using the syntax contained in the RADEC learning model. The selection of research subjects was carried out through purposive sampling techniques and the research subjects in this study were class IV B students with a total of 32 students. Data collection techniques in research are observation and interviews. The results of this research showed an increase from the implementation of cycle I, namely at meeting one and meeting 2 there was an increase of 6.6% and in cycle 2 at meeting 1 and meeting 2 there was an increase of 13.34%. Based on the results of this research, it can be seen that implementing learning using the RADEC learning model can improve students' collaboration skills in science learning. Based on the research that has been done, it can be said that the RADEC learning model can improve student collaboration skills in the learning process which is marked by the fulfillment of collaboration skill indicators by students.

Keywords: Collaboration Skills; IPAS; RADEC.

Introduction

At this time the 21st century continues, which is closely related to technology. Technology innovates continuously to make work easier. According to Lestyanningrum, et al [1], technological innovation causes concern for humans, this is because human work can be replaced with technology that is currently developing, one of which is robots [1]. To avoid such things, each individual needs skills. These skills become a stronghold for every individual in facing current developments, one of which is in the 21st century [2].

This is reinforced by Kivunjav's opinion, which states that every human being needs skills to be able to compete in the development of the 21st century [3]. These skills are often referred to as the 4Cs, which consist of critical thinking skills, creativity thinking skills, and communication skills and collaboration skills. Collaboration in the learning process is a form of collaboration with one another helping and complementing each other to perform certain tasks in order to achieve a predetermined goal [4]. Based on this, every individual must be able to master at least one skill in dealing with developments in the 21st century which are very closely related to technology, one of which is in the field of education.

Teaching and learning activities or often known as the learning process. Learning is carried out by involving

teachers, students and learning resources which can increase interaction in the learning process so that learning objectives can be achieved [5]. During the learning process, to achieve learning objectives, it is necessary to have a learning plan. According to Syaparuddin, Meldianus & Elihami [6] said that a learning plan or learning steps must be prepared by the teacher when carrying out the learning process so that it takes place effectively. The learning plan created does not only focus on the teacher but more on the role of students who are actively involved in the learning process [6]. Therefore, it is important for a teacher to prepare a learning plan, so that the learning process can run effectively and efficiently so as to achieve learning goals.

In learning planning there are several important components, one of which is the learning model [7]. The learning model can be used as a reference for teachers in selecting and also preparing a form of learning process that is adapted to the characteristics and needs of students to achieve learning goals [8].

In elementary schools there is one subject, namely science or often called science, while in the independent curriculum it is known as science but has the same concepts and principles in studying science for students. Science learning is learning about everything that exists in the environment around human life, so that science learning is considered fun and easy for students to understand [9]. Learning science and science related to everyday life

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requires teachers to be able to create a contextual learning process so that students can easily accept the learning delivered by the teacher because not only theoretical aspects can be obtained but they can also know the real causes of events or events. events in everyday life [10] . The learning method that teachers usually use in the science learning process is the contextual learning method, making it easier for teachers and students to achieve learning goals.

The implementation of science and science learning in the classroom must be able to build an active learning atmosphere that supports improving the thinking, discussion and question and answer processes of students. Furthermore, science learning is attempted to improve the ability to understand concepts in science learning for students [11] . Through this contextual approach, students will learn better and more meaningfully if students discover and experience for themselves what they are learning, not just knowing [16]. Contextual learning in the classroom regarding energy changes material, namely when the teacher brings batteries and light bulbs that are assembled and sees changes in energy from chemicals that come from batteries and light that comes out of lamps, so that with this activity students know energy changes directly.

The causes of students' low skills in collaborating in the learning process are learning activities that are less interesting for students so that students get bored easily and also a lack of involving students in the learning process such as problem solving, especially in learning Changes in Energy Forms [17]. In this way, researchers try to use a learning model that is appropriate for science learning, especially in science learning about changes in forms of energy [18]. Therefore, through this research, researchers tried to use the RADEC learning model to see whether this learning model could improve students' communication and collaboration skills in accordance with the 4C skills in 21st century education.

Based on the results of research that has been carried out, the researcher has several alternative learning models that can be used to solve emerging problems that can be used to solve problems regarding communication and collaboration skills in class IV B students. These alternatives are based on the results of research that has been carried out by previous researchers and an investigation into the advantages of learning models [19]. Alternative learning models are the TGT (teams games tournaments) type cooperative learning model, talking stick learning model, time token learning model and RADEC learning model. After the researcher studied the advantages and disadvantages of these models and looked at the characteristics of the models and the problems of students in class IV B of SD Negeri 34/I Teratai where students were less active in the learning process and learning was not centered on students, the researcher concluded that The RADEC learning model is the right solution because it has many advantages, one of which is that it can improve students' skills in expressing opinions both orally and in writing and is in accordance with the characteristics of students,

The varied learning model can be adapted to the conditions in the classroom. One learning model that can be used is the RADEC learning model. The RADEC learning model has the basic principle of being able to increase the potential and abilities of more qualified students

independently regarding insight, knowledge and skills [20] . The RADEC learning model is a new idea in the world of education that hopes for 21st century achievements in developing character and also improving students' creative and innovative thinking abilities.

Based on the background description above, researchers will improve 4C abilities, especially in student collaboration skills in science subjects, energy transformation materials with PTK research, so that using the RADEC learning model can make it easier for teachers and students in the learning process and then the planned learning objectives can be achieved. achieved. The research taken by this researcher was entitled "Improving Student Collaboration Skills Using the RADEC Model in Class IV Natural Science Elementary School."

Research Methods

This research uses the type of classroom action research (PTK). Class action research means research is an approach to actual problems and the occurrence of changes in the learning process faced by in the field [20] This research was carried out in class IV B at SD Negeri 34/I Muara Bulian which was carried out in the odd semester 2023/2024 with a total of 32 students with relatively low collaboration skills. The research material object is science learning on energy transformation of materials.

The procedure in this research is classroom action research (PTK) which consists of 2 cycles with each cycle consisting of four stages, starting from planning, implementing actions, observing and then reflecting to find out changes or improvements in the actions given.

The implementation of each cycle can be described, namely, the planning stage of this research was carried out in two cycles. Each cycle is held twice. The learning actions carried out in each cycle are adjusted to the learning implementation plan. Implementation of science and technology learning using the RADEC Learning Model in class VI SDN 34/I Teratai with a total of 32 students. The implementation of this classroom action research went through four stages, namely, the planning stage, the implementation stage, the observation stage, and the reflection stage. After going through these stages, data was obtained related to the aim of this research, namely to improve students' communication and collaboration skills using the RADEC Learning Model in class VI SDN 34/I Teratai. At the planning stage, the researcher as well as the implementer of the action and also observers, namely colleagues, prepare a plan that will be implemented. The activities carried out at this stage include the following: At this stage several activities are carried out, namely preparing teacher books and student books, preparing lesson plans (RPP), making observation sheets, making pre-learning questions, student worksheets (STUDENT WORKSHEET) and student evaluation question sheets. At this stage there are also several activities that are carried out, namely first determining the material that will be taken, while the material taken is changing energy. Then the implementation learning plan (RPP) is also included and also adjusted to the learning model that will be used during the learning process, namely the RADEC learning model. Then the researcher also prepared relevant material from several references to support learning activities. The author

prepares an observation sheet. At this stage there are several activities, including the researcher first adjusting the observation sheet made with the indicators that have been made previously. Student activity observation sheet, this sheet contains scores that will be filled in according to the aspects that will be assessed at meeting 1 and meeting 2. Apart from that, the author also created an implementation instrument for the RADEC model. Prepare pre-learning questions and student worksheets (STUDENT WORKSHEET). At this stage the researcher also makes student worksheets (STUDENT WORKSHEET) according to the material. At this stage, the researcher prepares a test sheet that will be used at the second meeting or at the end of the cycle. The test question sheet contains questions regarding the material that has been presented to see the success of student learning.

Implementation of Actions At this stage the researcher carries out actions in accordance with the plans that have been prepared previously, because the plans are a guideline for implementing the actions that will be carried out. The implementation of research actions was carried out in two action-giving meetings, each meeting contained steps in the learning process activities and also gave evaluation questions at the end of cycle I to assess student learning outcomes during the learning process with material on energy changes. In cycle II, where the syntax is explained, Read: Students read textbooks from both student books in the reduced curriculum and other sources (the internet) at home about generative plant reproduction, Answer: Students answer the pre-learning questions that have been given previously by the teacher, In At the beginning of the lesson the teacher greets the students and answers the greetings. Next, the teacher asked the class leader to lead a prayer together before the lesson started. The teacher checks the students' attendance. The teacher explains the stages of the RADEC learning model. Next, the teacher opens the lesson and informs about the material that will be taught, followed by apperception through questions and answers related to what will be taught to explore students' knowledge and after that the teacher conveys the learning objectives. d) Discuss Students determine their own groups and are asked to sit according to their respective groups. Students work on STUDENT WORKSHEET learning concepts in groups. Students work on tasks that are basically the same as the tasks in the pre-learning questions. Students discuss group answers and agree on the answers. then put it in the STUDENT WORKSHEET. e) Explain Students representing each group are asked to present the results of their discussion, Students from other groups are asked to pay attention to what is being presented and can provide suggestions and questions to the presenting group, f) Closing The teacher asks students to conclude the results of the lesson they have studied together. -sama, then the teacher provides reinforcement in the form of conclusions from the results of the learning that has been implemented. Students are given the opportunity to ask questions if there is something they do not understand about the material they have studied. The teacher delivers the assignment to learn a new chapter and asks students to answer pre-learning questions at home. Before going home the teacher and students pray together and the teacher greets the students.

Observations of communication and collaboration skills were carried out by observers using observation sheets. The results of observations at the second meeting of cycle I showed that several students experienced an increase in their learning activity. This can be seen from the results of observations on the student communication and collaboration skills observation sheet. The following are the results of observations of learning activity seen by each indicator and each student as well as observation data on learning implementation using the RADEC model.

Reflections carried out by researchers and observers on the learning process using the RADEC model. This is based on the results of implementing actions and observations at the first and second meetings in cycle I to determine actions in cycle II. Reflection is carried out using an observation sheet. After the researchers obtained data obtained from implementation and observation activities, it was discovered that the results of student activity in cycle I were in the quite active category. Based on the reflections carried out by researchers and observers to improve communication and collaboration skills in cycle II, in the future the researcher will take the following actions: 1) Revise the Teaching Module, by adding supporting activities and the researcher will also use power point media or learning videos It is hoped that students will more easily understand the material. 2) In groups, it is recommended that there be a division of tasks so that all students work to complete their tasks individually. 3) Students are invited to get closer to the teacher by eliminating the distance that exists between the teacher and students. Teachers provide motivation so that students dare to express opinions or express their ideas to grow students' self-confidence by providing rewards in the form of praise for active students. 4) Enthusiasm in fostering student interest and motivation so that students become enthusiastic and enthusiastic in learning, namely by doing ice breaking and singing songs related to the material. The songs sung are usually the composition that students usually hear but the lyrics are adapted to the material. 5) Encourage groups to be united in performing their tasks by holding a most compact group competition. 6) Give rewards in the form of stationery to the best and most compact groups so that students are motivated again to complete their group assignments.

Results and Discussion

Cycle I

In the implementation of cycle 1, 2 meetings were held with a time allocation of 2x35 minutes (2 lesson hours) starting with the following stages:

Planning stage

At the time of carrying out this research, the researcher was directly involved in the research process. Cycle 1 action planning begins with researchers and Class teachers discuss determining research time. On stages This a number of activities Which is done that is preparing teacher books and student books, compiling learning tools such as Teaching Modules, make observation sheets, make pre-learning questions, Work participant education (STUDENT WORKSHEET) sheets and assessment

instruments during the learning process such as student evaluation question sheet. In this stage too there is a number of activity Which is carried out, namely first determining the material to be taken, The material taken is IPAS Chapter 5 Energy Transformation material . Then plan the implementation of learning in the Teaching Module also included and adapted to the learning model that will be used at the moment of the learning process that is the RADEC learning model. Then researchers also prepared the relevant materials from some references to support learning activities.

The author prepares an observation sheet. At this stage there are several activities, including the researcher adjusting first sheet observation Which made with indicators Which has previously been made. Collaboration skills observation sheet, this sheet has a score which will be filled in according to the aspects that will be assessed at meeting 1 and meeting 2. Besides that the writer also makes instruments implementation of the RADEC model.

Implementation stage

At the implementation stage of the learning process, the researcher carries out the implementation according to the plans that have been prepared previously. This is because the planning that has been made becomes a guideline in implementing the learning process. The implementation carried out by the researcher in this cycle was two meetings by providing actions containing steps in the learning process in accordance with the syntax contained in the RADEC learning model with science learning material, namely energy transformation. In the initial research activity, this activity begins with the teacher saying greetings which are answered by students with enthusiasm, students are asked to check their neatness and class cleanliness so that they are ready to receive lessons well, after that the teacher invites students to pray together led by the class leader , then the teacher asked about the news and followed by conducting attendance to check student attendance by asking who was not present today and it turned out 4 people were not able to attend. Students are invited to sing songs from Sabang to Marauke . The teacher provides reinforcement about the importance of instilling a national spirit. Students prepare personal neatness, writing tools and be disciplined in learning. The teacher links the previous material with the material to be studied which is related to the students' experiences. Next, the teacher conveys the theme and objectives of the learning day This is IPAS Chapter 5 Energy Transformation material and before starting the learning process so that students are more focused and enthusiastic,

the teacher invites students To do an ice breaker, that is, clap open and close. Teacher First gives an example and then the students follow the instructions from the teacher.

The learning steps are in accordance with the syntax contained in the science and science learning process using the RADEC learning model, namely: 1) Read in the first stage where students read the science and science textbook or reading sources that are appropriate to the teaching material 2) Answer in the second stage where students ask questions. answer with the teacher regarding the reading that is read. 3) Discussion at this stage where students are divided into several groups to work on STUDENT WORKSHEET that has been prepared by the teacher in collaboration with group friends who are randomly assigned by the teacher heterogeneously. 4) Explain at this stage after all groups have finished working on the STUDENT WORKSHEET, the teacher asks each group To proceed convey results of the discussion Which started from The group that completes the discussion task first. But when group 1 was asked to come forward they didn't believe it themselves and don't understand how to convey the results of the discussion so that the teacher didn't request group 2 Which proceed moreover previously Then continued group 3,4, 5 And 1. During appearance results discussion, each group listening group Which proceeds while matching answer group with their answers. Each group finishes displaying the results. In the discussion, the teacher invites students to give appreciation in the form of applause and also give praise. On activity closing, Teacher together participant educate do reflect regarding what has been learned and summarizing the results of the discussion This has been done, which is one of the points in the RADEC model, namely Create .

Observation stage

Activity observation on cycle I done To know enhance collaboration skills participant educate with use RADEC learning model on process learning. At the observation stage, colleagues make observations to collaborate skills student Study And implementation of the RADEC learning model during learning activities. Observation done based on sheet observation Which has been arranged previously. Stage observation This aim For obtain information related to students' collaboration skills and usage learning model RADEC and also record change Which happens after worn action. Meanwhile, regarding students' collaboration skills in the learning process, the following are the results of students' collaboration skills in the learning process, namely:

Table 1. Results Observation Indicator Collaboration Skills Learners cycle I

Indicator Which observed	Meetings I		Meetings II		Flats - Flats	
	Score	%	Score	%	Score	%
Cooperation	7	35	15	75	22	55
Responsibility	8	40	11	55	19	47.5
Compromise	8	40	14	70	22	55
Communications	12	60	15	75	27	67.5
Flexibility	10	50	11	55	21	52.5

Based on the table of observation results for indicators of student collaboration skills above, the results

of student collaboration skills in the learning process can be seen. From the table, it can be seen that there is an increase

in students' collaboration and collaboration skills for each indicator in the form of a percentage of collaboration at the first meeting of 35% and at the second meeting of 75%, responsibility is at the meeting. The first meeting is 40% and the second meeting is 55%, compromise at the first meeting 40% and the second meeting 70%, communication at the first meeting 60% and the second meeting 75% and the first meeting 50% and the second meetings 55%. Based on the results of this research, it can be said that there has been an increase in collaboration skills in students. This is similar to the results of research conducted by Yulianti, et al [21] which said that the RADEC learning model can improve students' critical thinking skills so that it makes it easier for students to carry out group discussions with peers.

Cycle II

During the implementation of this research, the researcher was directly involved in the study process. Planning action cycle II This started with discussing with the class teacher regarding research time. Cycle II was carried out in date 08 January And January 15 2024. As for activity The implementation stages carried out by researchers are: 1) Carrying out discussion with Teacher class about How to solve the problems faced and what is the right way to deal with these problems Which will be applied on cycle 1 with use RADEC learning model ; 2) Create a Learning Implementation Plan that will be used in cycle II using the RADEC model; And 3) Implement learning tools have been arranged.

Implementation stage

This activity begins with the teacher saying greetings which are answered by students with enthusiasm, students are asked to check their neatness and class cleanliness so that they are ready to receive lessons well, after that the teacher invites students to pray together led by the class leader , then the teacher asked about the news and followed by conducting attendance to check student attendance by asking who was not present today and it turned out 4 people were not able to attend. Students are invited to sing songs from Sabang to Marauke. The teacher provides reinforcement about the importance of instilling a national spirit. Students prepare personal neatness, writing tools and be disciplined in learning. The teacher links the previous material with the material to be studied which is related to the students' experiences. Next, the teacher conveys the theme and objectives of the learning day This is IPAS Chapter 5 Energy Transformation material and before starting the learning process so that students are more focused and enthusiastic, the teacher invites students To do an ice breaker, that is, clap open and close. Teacher First gives an example and then the students follow the instructions from the teacher.

Enter activity core, moreover previously the teacher asks students to read teaching material regarding energy transformations. In this activity, the syntax found in the RADEC learning model is Read . This was followed by a question and answer activity. When this question was asked there were only a few students who answered the question given by the teacher. Next the teacher shows picture about several objects in everyday life that are displayed with a

projector. Furthermore while participants educate notice picture, the teacher asks several questions. This question and answer activity is one of the syntaxes in the RADEC learning model, namely Answer.

In this activity you can really see how the students' communication skills are in the learning process, there are only a few students who have good communication skills.

The next learning activity is discussion, which is one of the syntaxes in the RADEC learning model, namely Discuss . Before the teacher distributes groups to students, the teacher asks students to prepare the necessary stationery. Next, teacher share participant educate becomes 7 groups in a heterogeneous way, moment Teacher share group participant educate looks Confused And anxious about being separated from his classmates. Once the group is divided, the teacher asks students to sit with their groups and the teacher distributes student worksheet as discussion material, educating participants looks curious about the contents of the student worksheet. Before the discussion process, the teacher provides related directions how to work on a student worksheet by involving students to read out the steps for working on a student worksheet, while explaining, there are students who ask questions how and where write name group and part big other didn't 't paid attention because he was busy with his own student worksheet, so the teacher gave warning for notice more over previously before work and students finally want to pay attention to the teacher and after students understand how to work on the student worksheet teacher welcome participant educate discuss with the group to resolve existing problems on student worksheet. Teacher accompanies participant educate in process discussion for help if they experience difficulties, most students will ask the teacher about the contents of the student worksheet is not understandable. Most of the appear so serious discuss to resolve problems and a small number of them also seemed to be discussed, although occasionally interspersed with jokes and they even looked while standing moment do student worksheet the. Participants educate do student worksheet with help text reading regarding energy transformation and also through experiences in everyday life. In this group learning process, the teacher can see how the communication skills and collaboration skills of the students are.

After all groups have finished working on the student worksheet, the teacher asks each group to group for proceed convey results of the discussion Which started from the group that completes the discussion task first. During appearance results discussion, each group listening group Which proceeds while matching answer group with their answers. Each group finishes displaying the results. In the discussion, the teacher invites students to give appreciation in the form of applause and also give praise. This activity shows the RADEC syntax that is explained.

After all groups proceed displaying the results of the discussion, Teacher gives students the opportunity to ask questions that are not yet understood regarding the problem which has been completed. It turns out there are students who don't understand the problem, namely energy transformation, namely the change from one energy to two or more energies, so the teacher also provides an explanation and discusses it together. and it turned out that several students were able to answer and give examples of one energy that can change into two energies, such as

television, cellphones and so on. During this activity several were seen Students who don't pay attention actually played with the paper made into a toy and fun to chat with friends.

On activity closing, Teacher together participant educate do reflect regarding what has been learned and summarizing the results of the discussion This has been done, which is one of the points in the RADEC model, namely Create . The teacher reviews the lesson by asking questions. Conclusion Which final is regarding the impact of not saving energy. During this activity, if there is a group that is not paying attention then the teacher will rebook him

and ask them to answer question which was delivered previously. Furthermore, Teacher give participant students the opportunity to express opinions regarding today's learning and from the questions given by the teacher only a few students were dominant in answering them and there were still students who were still passive. This activity is a RADEC syntax that is Create. Next Teacher close learning by saying regards and accept love Then welcome students to rest.

Students' collaboration skills in the learning process, the following are the results of students' collaboration skills in the learning process, namely:

Table 2. Results Observation Indicator Collaboration Skills Learners cycle II

Indicator Which observed	Meetings I		Meetings II		Flats - Flats	
	Score	%	Score	%	Score	%
Cooperation	12	35	15	75	22	55
Responsibility	10	40	11	55	19	47.5
Compromise	14	40	14	70	22	55
Communications	14	60	15	75	27	67.5
Flexibility	13	50	11	55	21	52.5

Based on the table of observation results for indicators of student collaboration skills above, the results of student collaboration skills in the learning process can be seen. From the table, it can be seen that there is an increase in students' collaboration and collaboration skills for each indicator in the form of a percentage of collaboration at the first meeting of 35% and at the second meeting of 75%, responsibility is at the meeting. The first meeting is 40% and the second meeting is 55%, compromise at the first meeting 40% And the second meeting 70%, communication at the first meeting 60% and the second meeting 75% and at the first meeting 50% and the second meeting 55%. Thus, the data shows that the difference in the increase in students' collaboration skills, which is marked by an increase in the percentage of collaboration skills in cycle I and cycle II, is due to the actions taken by the teacher in the RADEC learning model. In the first cycle the teacher divides groups of 6-8 students into one group, while in the second cycle the teacher divides groups of 4-5 students into one group, making it easier for students to learn, besides that, learning media also influences the success of improving collaboration skills where in cycle I the teacher only uses pictures and in cycle II the teacher uses learning videos so as to provide enthusiasm for students in learning.

Based on the table above, the RADEC model has a good impact in improving students' collaboration skills in the learning process which can be seen in the increase in each cycle. The research results also show that in the learning process it can be seen that from each cycle there is an increase in collaboration skills, where the discussion syntax contained in the RADEC learning model really has an influence on improving collaboration skills in the research being carried out. Collaboration skills are more dominated by male students than female students. This is reinforced by the opinion of Riak & Harnanto who say that collaboration skills in students can be created from the teacher's skills in providing variations in the learning process [21]. Variations in the learning process greatly influence the success of the learning process and the goals to be achieved [22].

Such as research conducted by Ilham S, Muhammad, Syarifuddin, Kune [22] which stated that there was a significant influence between the RADEC learning model with the help of the Zoom application on the science critical thinking abilities of class VI students at SDN Kalukuang 1 Makassar in the era of the Covid-19 pandemic which was shown based on Sig (2 tailed) result is 0.000. Apart from that, research conducted by Pratama, Sopandi, and Hidayah [23] can be concluded that the RADEC learning model can improve students' high-level thinking abilities in elementary schools as seen based on the average post-test score for the RADEC class of 70.08 compared to The average pretest score was 40.44, which means there was an increase of 29.54. This is also supported by research by Fuziani et al [24] based on research entitled "The influence of the RADEC learning model on elementary school students' higher order thinking skills". The results obtained were that during the implementation of the research there were significant changes in the test results carried out before and after implementing the RADEC learning model, so that this RADEC learning model was considered capable of being another solution for improving HOTS.

Based on this, providing variations in the learning process using the RADEC model and also integrating with technological developments has a great influence on the development of students, especially in collaboration skills.

Conclusion

Based on the results of data analysis of classroom action research has been implemented in science learning for students class IV B SD Negeri 34/I Teratai, so it can be concluded that using the RADEC model can increase collaboration skills participants educate in learning. Matter This can be seen from 5 indicators that have been implemented well in cycle II. On cycle I percentage success action Not yet experience enhancement Where meeting I success _ his actions is 42.85% while on meeting II is also as big 42.85%. On cycles II collaboration skills students

experienced an increase between meetings I and II of 13.34%, meeting I, the percentage of success of the action was 66.66% while at meeting II was 80% in the good category. With these gains in cycle II has reached the level of research success which is expected.

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References

- [1] Lestyningrum, I. K. M., Trisiana, A., Safitri, D. A., & Pratama, A. Y. (2022). *Pendidikan Global Berbasis Teknologi Digital di Era Milenial*. Unisri Press.
- [2] Saavedra, A. R., & Opfer, V. D. (2012). Learning 21st-century skills requires 21st-century teaching. *Phi Delta Kappan*, 94(2), 8-13.
- [3] Kivunja, C. (2015). Teaching students to learn and to work well with 21st century skills: Unpacking the career and life skills domain of the new learning paradigm. *International Journal of Higher Education*, 4(1), 1-11.
- [4] Sukendro, S., & Ugi Nugraha, U. (2023). *Penggunaan Media Question Card Untuk Meningkatkan Keaktifan Belajar Peserta Didik Pada Muatan Ipa Di Kelas Iv Madrasah Ibtidaiyah Nurul Hikmah Kota Jambi* (Doctoral dissertation, UNIVERSITAS JAMBI).
- [5] 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.
- [5] Mulyana, M., Rainanto, BH, Astrini, D., & Puspitasari, R. (2020). Students' perceptions of the use of online lecture applications during the Covid-19 outbreak. *JAS-PT (Journal of Indonesian Higher Education System Analysis)*, 4(1), 47.
- [6] Syaparuddin, S., Meldianus, M., & Elihami, E. (2020). Active learning strategies in increasing students' civics learning motivation. *Master Teacher: Journal of Elementary School Teacher Education*, 1(1), 30-41.
- [7] Syahrial, S., Asria, A., Sabil, H., Kurniawan, D. A., Perdana, R., & Kiska, N. D. (2022). Development of E-Module Based on the Traditional Puyuh Game on the Cooperation Character and the Tolerance of Elementary School Students. *Journal of Innovation in Educational and Cultural Research*, 3(3), 478-486.
- [8] Rosarina, G., Sudin, A., & Sujana, A. (2016). Penerapan model discovery learning untuk meningkatkan hasil belajar siswa pada materi perubahan wujud benda. *Jurnal Pena Ilmiah*, 1(1).
- [9] Maghfiroh, E., & Arifin, S. (2021). Implementasi Pembelajaran Menyenangkan Dengan Model Teams Games Tournament (TGT) Untuk Memudahkan Pembelajaran IPA Terhadap Peserta Didik. *Bidayatuna Jurnal Pendidikan Guru Mandrasah Ibtidaiyah*, 4(2), 213-231.
- [10] Rahmasari, R. (2016). Penerapan Model Pembelajaran Problem Based Learning Untuk Meningkatkan Hasil Belajar IPA Kelas IV SD. *Basic Education*, 5(36), 3-456.
- [11] Sabil, H., Asrial, A., Syahrial, S., Kiska, N. D., Saputri, J., Damayanti, L., ... & Silvia, N. (2021). Problem-Based Learning Model in Classroom Management with Scaffolding Techniques on Learning Outcomes and Student Independence. *International Journal of Elementary Education*, 5(4), 657-665.
- [12] Fiteriani, I., & Baharudin, B. (2018). Analisis perbedaan hasil belajar kognitif menggunakan metode pembelajaran kooperatif yang berkombinasipada materi IPA di MIN Bandar Lampung. *TERAMPIL: Jurnal Pendidikan Dan Pembelajaran Dasar*, 4(2), 1-30.
- [13] Sopandi, W. (2019). Sosialisasi dan Workshop Implementasi Model Pembelajaran RADEC Bagi Guru-Guru Pendidikan dasar dan Menengah. *Pedagogia: Jurnal Pendidikan*, 8(1), 19-34.
- [14] Andrianingrum, F., & Suparman. (2019). Design of interactive learning media based on contextual approach to improve problem-solving ability in fourth grade students. *International Journal of Scientific and Technology Research*, 8(11), 3906–3911.
- [15] Tulljanah, R., & Amini, R. (2021). Model pembelajaran RADEC sebagai alternatif dalam meningkatkan higher order thinking skill pada pembelajaran IPA di sekolah dasar: Systematic review. *Jurnal Basicedu*, 5(6), 5508-5519..
- [16] Hendriarto, P., Mursidi, A., Kalbuana, N., Aini, N., & Aslan, A. (2021). Understanding the Implications of Research Skills Development Framework for Indonesian Academic Outcomes Improvement. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 6(2), 51-60.
- [17] Pratama, Y. A., Sopandi, W., Hidayah, Y., & Trihatusti, M. (2020). Pengaruh model pembelajaran RADEC terhadap keterampilan berpikir tingkat tinggi siswa sekolah dasar. *JINoP (Jurnal Inovasi Pembelajaran)*, 6(2), 191-203.
- [18] Hasan, M., Malinda, L., Mukhlisah, I., Harahap, T. K., Hariati, E., & Widyasari, T. (2023). Penelitian Tindakan Kelas. *Penerbit Tahta Media*.
- [19] Mediatati, N., & Jati, D. H. P. (2023). Peningkatan kemampuan guru menyusun karya ilmiah berbasis penelitian tindakan kelas. *International Journal of Community Service Learning*, 7(2), 155-159.
- [20] Riak, S., & Hananto, H. (2023). Penerapan Model Pembelajaran Project-Based Learning Dalam Meningkatkan Keterampilan Kolaborasi, Kemampuan Regulasi Diri, Dan Keterampilan Berpikir Kreatif Pada Pembelajaran Biologi Topik Pembelahan Sel Pada Siswa Sma Kelas Xii Ipa. *Academy of Education Journal*, 14(2), 890-905.

- [21] Sabil, H., Asrial, A., Syahrial, S., Kiska, N. D., Saputri, J., Damayanti, L., ... & Silvia, N. (2021). Problem-Based Learning Model in Classroom Management with Scaffolding Techniques on Learning Outcomes and Student Independence. *International Journal of Elementary Education*, 5(4), 657-665.
- [22] Ilham, S., Muhammad, S., & Kune, R. (2020). Indonesian Journal of Primary Education Pengaruh Model Pembelajaran Radec Berbantuan Aplikasi Zoom. *Indonesian Journal of Primary Education Pengaruh*, 4(2), 174-83.
- [23] Pratama, Y. A., Sopandi, W., & Hidayah, Y. (2019). RADEC Learning Model (Read-Answer-Discuss-Explain And Create): The importance of building critical thinking skills in indonesian context. *International Journal for Educational and Vocational Studies*, 1(2), 109-115.
- [24] Fuziani, I., Istanti, T., & Arifin, M. H. (2021). Penerapan model pembelajaran radec dalam merancang kegiatan pembelajaran keberagaman budaya di sd kelas iv. *Jurnal Pendidikan Tambusai*, 5(3).