PRIMARYEDU

Primaryedu: Journal of Elementary Education
Volume 9, Number 1, Ffebruary 2025

P-ISSN: 2580-9326 | E-ISSN: 2580-7714

Equality of Learning Services through ESD-Oriented RADEC in Elementary School

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Article Info

Article history:

Received Oct 10th, 2024
Revised Dec 18th, 2024
Accepted Jan 23rd, 2025

Keywords:

Equity of Learning Services
RADEC
ESD.

Abstract

Equality in learning services is crucial to preparing all students to face global challenges such as climate change, social inequality, and technological advancements. Inequitable education exacerbates social disparities and hinders the achievement of Sustainable Development Goals (SDGs). Teachers, as agents of transformation, play a vital role in fostering inclusive, relevant learning environments. The RADEC model (Read, Answer, Discuss, Explain, and Create), integrated with Education for Sustainable Development (ESD) principles, offers a promising approach to enhancing academic competencies while instilling sustainability values. This study employed a mixed-method approach with an embedded concurrent strategy, collecting qualitative and quantitative data simultaneously. Participants included 32 fourth-grade students and one teacher. The instruments used include RADEC implementation observation sheets, the emergence of learning equality indicators, and teacher interview guides. Data were analyzed qualitatively to describe ESD-oriented RADEC implementation and equality in learning services, while quantitative analysis determined levels of implementation and indicator occurrences. The findings revealed that ESD-oriented RADEC implementation reached an "excellent" level, with an average implementation rate of 81%. Equality in learning services was rated "good," with an average indicator occurrence rate of 73%. These results highlight RADEC's potential in fostering equitable, sustainable education.

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INTRODUCTION

Equity in learning services is an urgency that cannot be overlooked in the context of 21st-century education (Trilling & Fadel., 2009). In Indonesia, where educational disparities still exist across regions, ensuring equal access to quality education is critical to empowering all students to face the complexities of the modern world. With increasingly complex global challenges such as climate change, social inequality, and rapid technological advancements, education must equip every student with relevant and equitable competencies. Without equal learning services, students

from diverse backgrounds risk falling behind, potentially worsening social disparities and hindering the achievement of the Sustainable Development Goals (SDGs).

Educational Sustainable Development (ESD) is part of the effort to achieve target 4 (SDGs 4), namely quality education. The agreement that the Sustainable Development Goals (SDGs) cannot be achieved without Education for Sustainable Development (ESD) has been confirmed by researchers such as (Sunthonkanokpong & Murphy, 2019; Heasly et al., 2020 & Listiawati, 2011). Countries around the world are working to ensure equitable access to inclusive, quality and sustainable educational opportunities for all children, youth and adults by 2030 (Nketsia et al., 2020; Mochtar et al., 2014). ESD focuses on education that supports sustainable development at all levels of education, with the aim of providing quality education and promoting sustainable human development (Mochtar et al., 2014). Through ESD, education seeks to equip students with knowledge, functional skills, attitudes and personalities that support sustainable development (Mochtar et al., 2014; Hastuti, 2009). Education is a learning process that takes place in formal institutions involving interactions between educators (teachers) and learners (students) in a learning environment (Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan, 2003). Designing a learning environment that takes into account each student and their interactions is often a neglected aspect. (Tanner, 2013) noted that learning is often only accessible to a small percentage of students in the class, because teachers tend to focus more on what students should learn than on who is being taught. Paying attention to the role of each student and involving them in the learning process is part of an effort to create equity in learning services.

Equity in learning services means that teachers pay attention to who they teach with the principle of "teaching for all." In this approach, each student is given the opportunity to actively participate, connect the material to their personal experiences, and develop their own knowledge. According to (Tanner, 2013) and (Reinholz et al., 2020), the criteria for creating equity in learning services include: 1) giving students the opportunity to think and talk about the material being learned, 2) encouraging and managing the active participation of all students, 3) building an inclusive and equitable classroom community, 4) using breakout rooms or study groups, and 5) utilizing chat-based participation or active discussions.

Initial observations on equity in learning services indicate that before using the ESD-oriented RADEC learning model, teachers were not optimal in meeting these criteria. Several indicators of equality of learning services, such as providing opportunities for all students to think and speak, and encouraging active participation, have not emerged consistently. In addition, breakout rooms and chat-based discussions have not been fully utilized in the learning process. Group discussion rooms, such as breakout rooms and chat, play a crucial role in enhancing learning equity by providing all students with the opportunity to participate actively. Introverted or less confident students can express their ideas more freely in small groups, without being intimidated by others. Additionally, group discussions encourage peer-to-peer learning, where students exchange thoughts and deepen their understanding from different perspectives. By accommodating various learning styles, these discussion spaces ensure that every student has equal opportunities to learn, think critically, and collaborate, creating an inclusive and equitable learning environment (Zubaidah, 2010; Smith et al., 2017; Samuels, 2018)

The Project-based Learning model is often used in educational contexts at various levels and subjects to increase student engagement. However, this model has several obstacles such as

high cost requirements, large time allocation, and difficulties for teachers in implementing it, especially in the context of education in Indonesia (Alves et al., 2012; Rohana, R., & Wahyudin, 2017; Sopandi, 2019). Therefore, a learning model is needed that not only supports equality of learning services but is also easier to implement in educational conditions in Indonesia.

The RADEC (Read, Answer, Discuss, Explain, Create) model is proposed as a solution to achieve equality of learning services in accordance with ESD values, one of which is the RADEC model encourages equality by encouraging active participation of all students without exception through the "Discussion" and "Explain" stages, which allow all students to engage in critical thinking and sharing ideas. This model optimizes the role of students in acquiring many useful competencies (Pratama et al., 2019). The characteristics of the RADEC model include: (1) encouraging active student participation, (2) encouraging independent learning, (3) connecting student knowledge with the material being studied, (4) being contextual by linking the subject matter to real phenomena, (5) providing opportunities to ask questions, discuss, and conclude, and (6) providing pre-learning tasks to deepen understanding. The RADEC model that will be applied in this study has the potential to create equality of learning services in the classroom according to the criteria offered by ESD The study aims to illustrate how applying this ESD-oriented RADEC model can foster equality in learning services in elementary schools, creating a foundation for a more inclusive and sustainable educational framework (Setiawan et al., 2022; Tulljanah & Amini, 2021 & Sopandi, 2021)

METHOD

This study uses a combination method, which is a method that combines qualitative and quantitative approaches. According to Creswell in (Sugiono, 2019), "A mixed methods design is useful when either the quantitative or qualitative approach by itself is inadequate to best understand a research problem or the strengths of both quantitative and qualitative research can provide the best understanding." The combination method is useful when the quantitative and qualitative approaches are not accurate enough in understanding the research problem. Through this method, the data obtained can be more valid, reliability and objectivity can be increased.

The combination strategy used is the concurrent embedded strategy, which applies qualitative and quantitative data collection simultaneously. The concurrent embedded strategy is the most appropriate choice for this study because it allows for the collection of qualitative and quantitative data simultaneously, which can complement each other to provide a more comprehensive understanding. In the context of research on the application of the RADEC learning model to achieve equality of learning services, this approach provides the advantage of exploring in-depth perspectives from students and teachers through qualitative data, namely interviews and observations, as well as measuring the effectiveness of the RADEC model through quantitative data, namely the emergence of RADEC implementation and the emergence of indicators of equality of learning services.

This study focuses on qualitative methods with quantitative data as support, and is chosen to collect both types of data during the implementation of the research plan. In this strategy, primary data plays a role in the research project, while additional data functions as support (Creswell, 2010). The research design of the concurrent embedded combination method is presented in Figure 1.

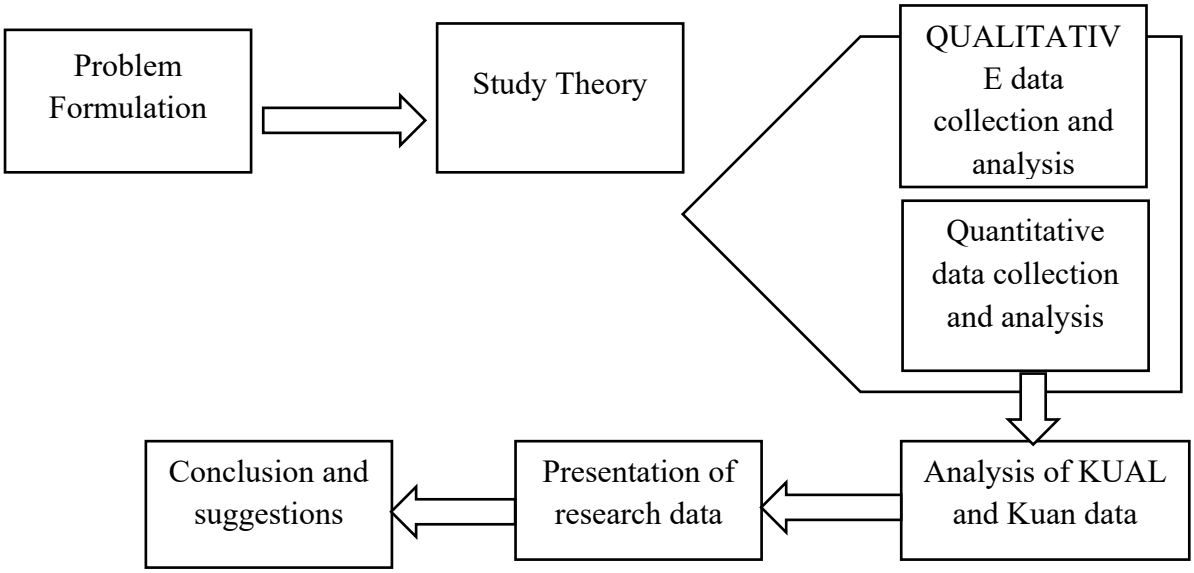

Figure 1. Concurrent Embedded Strategy Research Design
Sugiono, 2019

Description:
QUAL: qualitative data as a priority
QUAN: quantitative data as a supporter

The study was conducted in two stages. The first stage took place during the intervention with a qualitative descriptive approach to describe the initial conditions of equality in the learning process before the intervention. The next stage is qualitative after the intervention, which involves student and teacher responses to the implementation of ESD-based RADEC learning. The last stage is interpretation, which is to give meaning to the results of ESD-oriented RADEC learning in empowering equality in the learning process, based on the results of observations, interviews, and documentation studies in the form of meeting recordings, subject diaries, and the implementation of learning using the RADEC model that focuses on ESD.

The selection of participants in this study was not done randomly, so that the conditions of the participants were accepted as they were (Ruseffendi, 2010). The research participants involved 32 fourth-grade students of Elementary School Labschool, Universitas Pendidikan Indonesia, Bandung, consisting of 17 male students and 15 female students. Subjects were selected through a proportional stratified random sampling technique in the form of purposive sampling. One class was selected as a sample, and one fourth-grade teacher was also involved as a teacher. With the purposive sampling method, class selection was carried out randomly at each school level, but not being right in the implementation of the study was also a consideration in determining the sample.

The instruments used in this study were designed so that the data obtained were mutually supportive and complementary. The research instrument was developed based on previous theoretical and research studies, then validated. Validity is the process of collecting and evidence to support the conclusions of the analysis. The validated instruments include learning implementation guidelines, pre-learning questions, learning service equality observation sheets, and teacher interview guidelines. The assessment of the instrument through validation was carried out by experts (expert judgment) to ensure compliance with the test materials and performance indices being measured (Sukardi, 2012).

The instrument is declared representative if it covers all aspects being tested. Validation does not use a percentage achievement calculation system from the validator; the instrument is improved and used based on input and suggestions from the validators. Data analysis to describe the equality of learning services was carried out based on the learning service equality indicator instrument adopted and modified by researchers from the opinions of (Tanner, 2013) and (Reinholz et al., 2020) can be seen in table 1. in the previous chapter. The emergence based on the learning service equality indicator can be seen in table table 1.

Table 1. Learning Service Equity Indicators

No	Learning Service Equity Indicators	Sub Indicator of Equity of Learning Services	Implementation	
1	Provide opportunities for all students to think and talk about the material being studied	Poin 1-3	Yes	No
2	Encourage, demand, and actively manage the participation of all students	Poin 1-3		
3	Build a classroom community that is inclusive and equitable for all students	Poin 1-2		
4	Use discussion spaces	Poin 1-2		
5	Leverage discussion-based participation	Poin 1-2		

Learning is done online through zoom meetings. Learning activities on WhatsApp groups, and documentation of learning activities on Google forms. Researchers recorded learning through zoom meetings with the aim of collecting data on the implementation of the RADEC learning model, equality in learning services in the form of the emergence of equality indicators, and descriptions of other findings. This research documentation study is also to obtain a general picture before and after treatment, namely; lesson schedules, facilities that support students in online learning, and the number of students.

The way to calculate the implementation of learning is to use the following formula:

$$\text{Learning Implementation} = \frac{\Sigma\ activities\ carried\ out}{\Sigma\ all\ activities} \text{ x } 100\%$$

$$\text{Equivalency of Learning Services} = \frac{\Sigma\ activities\ carried\ out}{\Sigma\ all\ activities} \text{ x } 100\%$$

RESULTS AND DISCUSSION

The application of the RADEC (Read, Answer, Discuss, Explain, and Create) learning model oriented towards Education for Sustainable Development (ESD) aims to enhance equality in learning services and improve critical thinking skills among fourth-grade elementary students through online learning using Zoom meetings and WhatsApp groups. This study gathered findings from teacher and student observation sheets, teacher interviews, and critical thinking skill assessments. Online RADEC implementation was supported by recorded Zoom sessions, serving as a cross-validation tool for observational and interview data, offering clear insight into the online

learning process. Data validation was achieved by cross-checking Zoom recordings with observations from six observers and one classroom teacher, ensuring accuracy and consistency in findings throughout the study.

1. Implementation of the ESD-Oriented RADEC Learning Model

The application of the RADEC (Read, Answer, Discuss, Explain, and Create) learning model oriented towards Education for Sustainable Development (ESD) aims to enhance equality in learning services and improve critical thinking skills among fourth-grade elementary students through online learning using Zoom meetings and WhatsApp groups. This study gathered findings from teacher and student observation sheets, teacher interviews, and critical thinking skill assessments. Online RADEC implementation was supported by recorded Zoom sessions, serving as a cross-validation tool for observational and interview data, offering clear insight into the online learning process. Data validation was achieved by cross-checking Zoom recordings with observations from six observers and one classroom teacher, ensuring accuracy and consistency in findings throughout the study.

Table 2 . The Linkage of the ESD-Oriented RADEC Model to Equality in Learning Services

ESD Criteria	RADEC Steps Facilitating the Emergence of Expected Values/Skills in ESD Criteria	Description
Criterion 1 Focuses on the learners; student-centered, emphasizing the needs, abilities, interests, and learning styles of students, with the teacher acting only as a facilitator. Students spend their entire learning time engaging actively, taking responsibility for their own discovery and learning process.	**Read:** Students read information from various sources, including books, other printed materials, and electronic information sources such as the internet. **Answer:** Students answer pre-teaching questions based on the knowledge acquired through the reading activity, which is organized in the form of worksheets (LKS).	Provide all students with the opportunity to enhance their knowledge, as students utilize the entire learning time, engaging in the enthusiasm of learning through reading and any source during the pre-learning activities of read and answer. In addition, through these pre-learning activities, students analyze arguments both explicitly and implicitly from reading sources, then observe and consider the results of these activities, which are presented in the form of answers.
	Create: Students realize ideas or create works that can be done independently or in groups, either inside or outside the classroom, and can be short-term or long-term projects.	In creating a work, whether in the form of an idea or a product, the learning process is focused on the students' abilities and interests, with the teacher acting as a facilitator. Furthermore, in deciding on an action, students are facilitated to formulate alternative solutions to the problems presented during the lesson

		and decide on the actions they will take, either in the form of ideas or products.
Criterion 3 Education employs a multi-method approach, including words, art, drama, debate, experiences, and various pedagogical sciences. Teachers act as motivators, while students work and play together to achieve a learning goal.	**Discuss:** Students learn in groups to discuss their answers to pre-teaching questions. They also provide tutoring to classmates who have not yet mastered the material.	In the discussion activity, students collaborate to achieve a learning goal. Additionally, this discussion activity allows them to create and consider inductive results by seeking other explanations found within group members and evidence that supports the conclusions from the discussion, which may lead to emerging opinions expressed by the participants.
Criterion 7 Focuses on the learners; student-centered, prioritizing students' needs, abilities, interests, and learning styles, with the teacher serving only as a facilitator. Students utilize their entire learning time actively, encouraging them to take responsibility and engage in their own discovery-based learning process.	**Explain:** Students engage in presentation activities and explain important concepts in front of the class.	The explain activity shows that everyone can be a learner and a source of learning by inviting all students to access the information generated by each group, providing the opportunity to exchange information or learning resources for each individual student. It is also a student-centered activity, where students take responsibility for their own learning discovery process by publishing or presenting the results of their discussions. In addition, students here identify assumptions while listening to their classmates' presentations, which are necessary for constructing arguments regarding the problems or questions that have already been discussed and answered within the group.

Based on the findings of the RADEC stages, it can be interpreted as an indicator of the implementation of the RADEC model based on the study ((Pratama et al., 2019 & Nurzakiah Fuadi, 2020) of learning 1 & 2 as shown in the following table 3.

Table 3. Results of interpretation of the implementation of the RADEC Learning model

RADEC Stages	Persentase	Category	Description
Read	100%	Very well	Students do the reading stage in the pre-learning because the activity is carried out offline at their respective homes one day before online learning which is carried out via zoom meeting. However, reading activities without direct instruction from the teacher are carried out again by all students when they are in a group condition in the breakout room. Reading reading sources is done in turn by each group member, some are done simultaneously by all group members. Although not all information provided by the teacher is read again because the time felt by the group is not enough, so there is no initiative to add other sources.
Answer	100%	Very well	This stage is carried out as a whole based on the results of collecting pre-learning questions via Google Form and WhatsApp one day before the learning process. In addition, students also answer questions orally given by the teacher at the beginning of the learning process.
Discuss	67%	Good	Overall, this stage is implemented. Students study in groups in breakout rooms to discuss and agree on answers to questions given by the teacher in the form of LKPD via Google Form. However, there have been no student activities that indicate providing guidance to friends who have not mastered the material. Discussion activities include question and answer activities between group members, asking group members for their opinions, asking group members to express their opinions, and ensuring that the answers to the discussion results have been agreed upon by all group members.
Explain	100%	Very well	This activity is done by reading or presenting the results of the group discussion by one group representative and after the presentation the other groups respond. There is one group that reads the results of its discussion complete with new terms such as the ozone layer, biodiversity, terracing system, etc. These terms are explained by the group and raise questions and answers with the teacher and other students outside the group.
Create	40%	Moderate	This activity does not reach the realization of students' ideas, only until students convey their creative ideas in saving energy, due to time constraints. However, in learning when the learning objective is for students to ask interview questions, there are several students who in group discussions stated that interviews had been conducted with family members such as their fathers or mothers without being directly instructed by the teacher.
Average implementation	81%	Very well	

In the explanation of the learning activities above, it explains that the RADEC learning model has been implemented in the very good category. Overall, learning activities have been implemented, but there are stages of the RADEC learning model that have not been implemented. The pre-learning stage, namely reading and answering, although it has been implemented well, there needs to be communication between teachers and parents that this stage requires cooperation with parents not to help their sons and daughters complete the reading and answering stage work, considering that this activity is carried out at home which is forced by parents directly and teachers have limitations to ensure that students answer pre-learning questions whether they are purely independent results or assisted by parents. In addition, the answer stage also increases the maximum probing questions, questions that are exploratory in nature to get more answers from students who intend to develop the quality of answers further, so that the next answer is clearer, more accurate and more reasonable.

The discussion and creation stages have not been implemented optimally. The discussion stage is a challenge for teachers that ultimately provides significant change for students. In the future, teachers can follow up on this challenge, one of which is by encouraging small group engagement.. At this stage, some students based on the sub-indicators of the implementation of the discussion stage, there are still some who cannot participate in discussion activities as expected. This is not used as an obstacle, but can be used as a challenge in order to get maximum results from implementing this learning model. Courage and self-confidence are also thought to be factors causing the lack of student participation in discussion activities. This can be overcome by helping homogeneous student groups who participate less so that in urgent situations they will try to be brave and train their self-confidence. Likewise at the explanation stage, so that those who appear to present the results of their discussions are not only the same students. In addition, although the activity of conveying ideas continues at the discussion stage which is carried out in the zoom meeting breakout room, it is very embarrassing because it does not reach the realization of ideas on the grounds that the learning time is close to the fasting month activities and the situation of students who have assignments from other subjects that The discussion will reap protests from parents because there are too many assignments. So that in the future, the implementation of this model will require more free time.

There are difficulties in using this zoom meeting learning such as problems with zoom accounts that cannot record the process, poor internet signals so that students enter and exit zoom, when the teacher is explaining and displaying a power point cannot see all students on the monitor screen so that there are students who do not pay attention are not reprimanded, and students who do not follow learning activities. After being confirmed with the class teacher, the students experienced various obstacles personally. In this class there are obstacles that the teacher seems to have difficulty finding solutions to, namely related to the conditions at the student's own home, namely related to parental supervision and attention. The problem of parental supervision greatly affects the quality of student learning, especially at home. Many students face learning difficulties due to lack of attention and support from parents, which is often caused by limited time and resources. Children who receive more attention from their parents tend to have better academic achievement (Nisa, 2015; Nofrizal et al., 2020; Rini et al., 2020). Therefore, the role of parents in

supervising learning is very important to create an environment that supports students' academic success.

Courageous learning is learning that requires cooperation between teachers and parents. At the elementary school level in particular, the role of parents is very important to accompany their children while learning from home or courageous learning. In urban communities, many parents work, both fathers and mothers, children who take part in learning are not accompanied. As a result, they skip school, do not do assignments, and experience other obstacles such as lack of encouragement and motivation from the home environment where during courageous learning the home environment is the direct assessment of children to continue carrying out the expected learning and help overcome various obstacles experienced by students such as difficulty in understanding lessons, lack of concentration, absence of teachers, and boredom. For this reason, teachers or schools should facilitate the provision of special time to communicate with parents formally and must be carried out for all students, especially students who really need action to discuss and find solutions to obstacles that can be resolved together between teachers and parents. According to information, schools have facilitated courageous parenting seminars, but this activity is not mandatory so that parents who are usually busy and do not pay attention to their children do not participate in this parenting seminar. So the school's hope to provide solutions to students who have problems and need parental guidance is not achieved to the expected goal.

2. Description of Learning Service Equivalency

The following are the results of the interpretation of the learning service equality indicators adapted based on the opinions of (Tanner, 2013) and (Reinholz et al., 2020) learning 1&2 are shown in the following table 4.

Table 4. Results of satisfaction with learning services

Indicator	Persentase	Category	Description
Provide opportunities for all students to think and talk about the material being studied.	100%	Very well	All students get the same opportunity and time to think about the material through pre-learning activities, namely reading and answering pre-learning questions one day before the learning process via zoom meeting. In the discussion session, students not only focus on time estimation but also see the completion situation of each group. Students are also seen in their completion conditions in completing group discussions and are given additional time and by stimulating all group members to provide answers to the questions being discussed. In addition, students collect individual responses to pre-learning activities by collecting pre-learning questions via google form and all group members write down the results of their discussions via google form.
Encourage, demand, and actively manage	67%	Good	Students are randomly called by name by the teacher both at the beginning of the lesson before students enter group activities, discussion sessions, presentations, and at the end of the lesson to conclude the learning together.

the participation of all students.			Students who do not speak during the discussion are asked by the teacher to express their opinions. However, findings in the field show that not all students have time to be called by name by the teacher. Students also do discussion sessions not just being freed, but the teacher periodically continues to go around the group to ensure that all students participate in the discussion activities.
Building an inclusive and equitable classroom community for all students	100%	Good	Students are facilitated by learning resources, pre-learning questions, and questions used for discussion sessions by materials that are directly related to student experiences. For example, the impact of human actions on nature, the implementation of rights and obligations towards the environment. Students are also presented with relevant examples, for example, in pre-learning questions, the teacher provides a picture of a mutual cooperation activity of residents in cleaning the home environment, throwing away garbage, etc.
Using breakout rooms	100%	Very well	Students in learning activities have conducted discussions using the zoom meeting application which creates breakout rooms for six groups. Students contribute more to discussion sessions in breakout rooms compared to classical learning.
Leveraging discussion-based participation.	0%	Medium	Students have not been seen having casual and light conversations as a form of teacher attention to stimulate student participation. There are conversations between students outside the discussion of the material being discussed, but the dialogue carried out by the teacher is in the form of organizing learning activities and regarding learning materials. The lack of casual conversation between teachers and students suggests that more personal and informal interactions are not optimal for increasing student participation. Casual conversations outside of the subject matter can create a more relaxed learning atmosphere and support students to feel more comfortable, which in turn encourages their involvement in discussions. Recommendations for improvement include inserting informal conversations at the beginning or end of lessons, providing opportunities for students to talk about their interests, and using more interactive learning methods, such as small group discussions. In this way, teachers can strengthen social relationships with students, increase comfort, and encourage more active participation in learning.
Average occurrence of indicators	73%	Good	

Based on the findings and interpretations above, it shows that the equality of learning services has not been implemented optimally in online learning through zoom meetings assisted by WhatsApp. Overall, indicators of equality of learning services appear, but there are indicators that still need to be developed further in their emergence in learning activities. Indicators of encouraging, demanding, and actively managing student participation, this indicator still shows indicators that are still not optimal from the equality of learning services. This is because teachers find it difficult with the large number of students who still really need to get more encouragement so that their focus is evenly distributed and time is not sufficient, especially with limitations through online learning, where teachers cannot interact directly with students and see class conditions (Harisuddin, 2021; Anggraeni et al., 2021). In addition, indicators that utilize discussion-based participation have not yet emerged optimally. This allows teachers not to be accustomed to having flexible, light, and relaxed conversations to stimulate student responses during learning.

Indicators of equality of learning services, if observed, mostly strive for the participation of all students without exception. Participation brings important benefits, namely making the right decisions based on various ideas, developing abilities and creativity, receiving larger orders and demanding awareness and preparation to take responsibility and promote common interests.

After completing the RADEC learning model using zoom meeting, teachers were then interviewed to find out their responses regarding the RADEC learning model. The teachers' responses from the interview results are described in the following points:

1) Response to student behavior during learning using the ESD-oriented RADEC model

Student responses during learning using the ESD-oriented RADEC model based on observations by class teachers, there were several students who were less enthusiastic during the learning process. This may be because learning is carried out bravely. According to the class teacher, it may be much more effective if it is done face-to-face, direct discussion activities can make students more directly involved and enthusiastic. During learning outside of this research, only a few were responsive, at most only 10 students. Daring learning through zoom meetings is felt by only a few students who are paid attention to. Pre-learning activities allow students to focus more and utilize the material or reading materials provided, but daring learning makes it difficult to ascertain whether students read or not the reading materials provided. If learning is direct or face-to-face, it can be identified whether students read or not by looking at the answers in the pre-learning. However, daring learning is not like that because when giving assignments, students can have perfect descriptions but during daily live zoom meeting tests the results obtained by students can be very small, this means that there are external factors that can help students answer questions when answering assignments.Respon terhadap penyampaian materi ajar selama proses pembelajaran menggunakan model RADEC berorientasi ESD.

The delivery of open materials during the learning process using the ESD-oriented RADEC model based on teacher observations should all be conveyed. However, there may also be students who are still confused because they usually do not learn with a pattern like RADEC learning.

2) Response to the stages in the ESD-oriented RADEC model

The stages in the ESD-oriented RADEC model based on teacher observations, the reading stage is more optimally carried out classically through zoom meetings together to ensure that all students read the pre-learning reading materials. Whether or not students read is more observed. The answer stage can also be ensured that children work independently or not. The discussion stage is a very important stage, with discussions students gain new knowledge from their friends' opinions or discoveries. The explanation stage is very effective in helping to train students' communication verbally, besides that it also fosters an attitude of mutual respect and self-confidence. Meanwhile, the creation stage should be carried out at the very end of the learning sub-theme because if in each learning the discussion of the material is not yet complete, it is given to students. Of all the RADEC stages, the stage that is considered difficult in this case because the learning process is carried out in bold is the create stage which will be more effectively realized through teacher guidance in class face-to-face and the discussion stage will be much more effective if it is also carried out face-to-face, teachers feel that this stage is a very important stage

3) Response to obstacles felt by teachers during teaching using the ESD-oriented RADEC model

The obstacles felt by teachers when teaching using the ESD-oriented RADEC model are that by conducting online learning via zoom meetings, teachers have difficulty in managing student responses. For example, even though they have been called or asked to activate the camera and asked to answer, they still turn off the camera and just stay silent without any response. During the study, there were also several technical obstacles, for example, researchers had difficulty using accounts to record learning, so that learning was constrained because it did not use the available time effectively.

4) Impressions after using the ESD-oriented RADEC model

Students' impressions after using the ESD-oriented RADEC model according to teacher observations, if it can be done optimally at each stage, students will be more interested in learning. However, there are still some students who object to appearing and showing their opinions.

5) Suggestions for learning plans prepared based on the ESD-oriented RADEC model

The teacher's suggestion for the lesson plan prepared based on the ESD-oriented RADEC model is that if it is done face-to-face, learning will be more optimal with all its learning objectives. It is likely that more students will express their opinions. In addition, it would be good if this model is used often, many children may be surprised and not ready for learning to have to read first or read the reading independently, not directly explained by the teacher. For this reason, it is better if this RADEC model is used often so that children get used to it and improve student literacy, grow and students are active in reading.

CONCLUSION

The implementation of the ESD-oriented Read, Answer, Discuss, Explain, and Create (RADEC) learning model can be carried out well based on the implementation of the learning

steps. The Read, Answer, and Explore stages were implemented very well, the Discuss stage was also implemented well. However, the Create stage has not been implemented well. The implementation of learning reached 81%, including the very good category.

Equality of learning services using the ESD-oriented RADEC learning model can build equality of learning services. Providing opportunities for all students to think and talk about the material being studied, building an inclusive and fair classroom community for all students, and using breakout rooms are the indicators that appear the most. The indicators of encouraging, demanding, and actively managing the participation of all students have also performed well. However, indicators that utilize discussion-based participation have not been implemented. Overall, the disclosure of indicators of equality of learning services reached 73%, including in the good category.

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