

## Online Learning Through The RADEC Model to Increase HOTS of Elementary School Students in The Time of The Covid-19 Pandemic

Yoga Adi Pratama<sup>1</sup>, Laksmi Dewi<sup>2</sup>

<sup>1</sup>Universitas Pendidikan Indonesia, Indonesia

<sup>2</sup>Universitas Pendidikan Indonesia, Indonesia

<sup>1</sup>[yoga.adipratama@upi.edu](mailto:yoga.adipratama@upi.edu), <sup>2</sup>[laksmi@upi.edu](mailto:laksmi@upi.edu)

### Abstract

During the Covid-19 pandemic, thinking skills-oriented learning has not been implemented properly, the impact of student HOTS is getting lower. The purpose of this study is to increase the HOTS of elementary school students during the Covid-19 pandemic through the RADEC learning model. The research was conducted at SDN Harapan 1 Cimahi City. The research methodology uses classroom action research. Data collection techniques used are tests and observations. Data analysis used comparative analysis techniques and qualitative analysis. The results showed that there were only 2 students in the pre-cycle data that obtained the "good" criteria, in the first cycle it increased significantly to 15 students, and in the second cycle it increased again to 20 students. Furthermore, in the pre-cycle students who completed it reached 13 students (37.1%), in the first cycle increased to 28 students (80%), and the second cycle by 33 students (94.2%) who completed. This significant increase is because the entire syntax of the HOTS-oriented RADEC learning model can be easily implemented during the Covid-19 pandemic because the syntax is flexible, adaptive, and in accordance with the characteristics of Indonesian students. The conclusion of this study is that the RADEC learning model can increase the HOTS of grade IV students at SDN Harapan 1 for the 2020/2021 academic year during the Covid-19 pandemic.

**Keywords:** RADEC learning model, HOTS, elementary school

### INTRODUCTION

The Covid-19 pandemic has changed all aspects of the constellation of life, including education. Government policies that prioritize the health and safety of children and teachers make face-to-face learning that is usually done must be stopped and replaced with distance learning. That means, the Covid-19 pandemic is forcing education practitioners to move face-to-face learning rooms to virtual classrooms. The transfer of the study room emphasizes that education must be dynamic and ready to accept change. The implication is that efforts to increase human resources through education must continue to be carried out, of course taking into account health protocols. Furthermore, in the context of the 21st century, the urgency of increasing human resources is increasing because various countries are competing to be the best through innovations in the field of science and technology through increasing 21st century competencies.

Binkley, et al. (2012, pp. 18-19) describes the competencies needed in the 21st century, namely creative thinking skills, critical thinking, metacognitive thinking, communication,

collaboration, information literacy, ICT literacy (Communication Information Technology), citizenship, work and career, and individual and social responsibility skills. Furthermore, Trilling & Fadel (2009, p. 47) describes 21st century skills which include creative thinking and problem solving skills, communication and collaboration skills, and the ability to be creative and innovate. These skills are an essential basis for someone to be able to exist in the 21st century even in the pandemic era.

The abilities mentioned above can be represented through higher order thinking skills. Higher order thinking skills (HOTS) are complex abilities that include logic and reasoning abilities, analysis, evaluation, creation, problem solving, and decision making (judgment) (Brookhart, 2010, p. 29). Meanwhile, the definition of HOTS according to the national standards of OECD (The Organization for Economic Co-operation and Development), TIMSS (Trends In International Mathematics and Science Study), and PISA (The Program for International Student Assessment) is the ability to apply knowledge, skills, and values in making reasoning and reflection in solving a problem, making decisions, and being able to create something that has an innovative nature (Nugroho, 2018, pp. 16-17). Thus, HOTS is a thinking skill that not only requires the ability to remember, but is much deeper, namely the ability to analyze, evaluate, and create. These skills are certainly needed in the 21st century, especially during a pandemic to prevent a cyber pandemic, namely the outbreak of hoax viruses and false information about the Covid-19 virus that has filled social media timelines.

Based on the results of observations on the learning outcomes of fourth grade students at SDN Harapan 1 Cimahi City in HOTS questions, it shows that 73% of students are still having difficulties. This data is confirmed by the average HOTS question score in semester 1 of the 2020/2021 academic year which only reaches 55. The low HOTS is reinforced by the results of the HOTS questions presented both in daily assessments and in mid-semester assessments which are always difficult for students to answer. This confirms that HOTS-oriented learning has not been maximally implemented.

In fact, there have been many efforts or research before the pandemic that concluded that various innovative learning models from the west have been able to improve thinking skills (Duran & Dokme, 2016; Yuliati, et al., 2018). However, during the pandemic, innovative learning is still not implemented properly, this can be seen from the lack of scientific publications regarding innovative learning models from the west on thinking skills during the pandemic. Furthermore, in practice, this innovative learning model is very less used by teachers in learning. The results of Sopandi's research, et al. (2019) found that out of around 100 teachers

in the West Java region, only 10% could write down the syntax of the innovative learning model which they thought was most often used, the rest of the teachers did not understand and could not rewrite the syntax or it could be said that the teacher felt that he was implementing the learning model. innovative, when in fact it is not. Apart from being difficult to remember the syntax, the innovative learning model is considered less practical and requires a long time so that teachers are more comfortable using conventional learning models (lectures).

Therefore, the researcher offers one alternative to develop thinking skills during a pandemic, namely through the Read-Answer-Discuss-Explain and Create (RADEC) learning model. The RADEC learning model is one of the alternative learning models in accordance with Indonesian conditions (Sopandi, 2017). The name of this model is adapted to the syntax, namely Read, Answer, Discussion, Explain, and Create (RADEC). The syntax of the RADEC model is easy for primary and secondary education teachers to memorize (Sopandi, et al. 2019), so it is appropriate to use it as an alternative to innovative learning models in Indonesia. Besides being easy to memorize the syntax, this model exists on the basis of the Indonesian education system which requires students to understand many scientific concepts in a limited time. This model is the latest breakthrough in education during a pandemic that requires the achievement of 21st century competencies, character, and literacy accompanied by preparation for exams held by schools. Several studies have also proven that the RADEC learning model has a positive impact on learning outcomes, both material-oriented, namely understanding concepts (Lukmannudin, 2018), and HOTS-oriented (Jumanto, et al. 2018; Pratama, et al., 2019; Agustin, et al., 2021).

The RADEC learning model is very suitable for distance learning because the stages are flexible, which can be full online or blended learning (Ilham, S. dkk., 2020; Muslim, 2022). Of course this helps the teacher in formulating a lesson that can accommodate the characteristics of students and various learning infrastructure. For students who have smartphone facilities and internet connections, the RADEC learning model is carried out fully online through the help of the Whastapp, Google Classroom and Zoom applications. Meanwhile, for students who do not have a device or have difficulty accessing the internet, the RADEC learning model is implemented through a blended learning system where the Read, Answer, and Create stages are carried out asynchronously while the Discuss and Explain stages are carried out synchronously.

Based on the explanation above, the problem in this research can be formulated, namely "How can online learning through the RADEC learning model increase the HOTS of

elementary school students during the Covid-19 pandemic?". So the researchers took the title "Online Learning Through The Radec Model To Increase HOTS Of Elementary School Students In The Time Of The Covid-19 Pandemic".

## **METHOD**

This research was carried out at SDN Harapan 1 Cimahi, to be precise in class IV for the 2020/2021 academic year. The type of research conducted by the researcher is Classroom Action Research (CAR). Classroom Action Research (CAR) is research conducted by teachers in the classroom with the aim of improving their performance so that student learning outcomes increase. Researchers conducted CAR on fourth grade students with the aim of increasing students' HOTS, which is still relatively low during this pandemic.

The subjects of this study were fourth grade students for the 2020/2021 academic year, totaling 35 students consisting of 19 boys and 16 girls. The background of students varies, most of the students come from families with middle-class economy. There are 5 children who do not have a device so that blended learning is carried out.

The instrument used is a test to measure the HOTS of elementary school students on Theme 8, especially in fictional story material. The HOTS indicator used in this study is HOTS as a transfer of knowledge. HOTS as a transfer of knowledge is the highest stage of the revised Bloom's taxonomy which includes analyzing, evaluating, and creating (Brookhart, 2010). So that HOTS in the context of this research is a combination of two dimensions, namely the dimensions of knowledge: factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge; and dimensions of cognitive processes: analyzing, evaluating, and creating (Anderson & Krathwohl, 2001). However, in this study, the researchers deliberately limited the HOTS to be tested only at the level of C6 creating. The form of questions is made open descriptions so that students really issue their HOTS, because the description or essay tests provide more possibilities for developing critical and creative thinking skills which are an integral part of HOTS (Abidin, 2016, p. 146).

Then the HOTS score is categorized according to the criteria that have been determined in this study. The following categories of HOTS scores are based on the International Center for the Assessment of Higher Order Thinking (Prasetyani, et al., 2016).

Table 2. HOTS Assessment Categories

Criteria	Skor
Very good	81-100
Good	61-80
Enough	41-60
Not enough	21-40
Very less	0-20

Based on the table above, we can also know the level of completeness, which is 61, where the score is in the good category. In addition to the question sheet, the instrument used is the observation sheet. The observation sheet is a data collection tool used by researchers to see the findings during the learning process carried out. Observation sheets are used to assess the activities of students during the learning process and teacher activities are used to assess the ability of teachers to carry out learning. The data analysis used in this research is descriptive comparative and descriptive qualitative. Comparative descriptive is done by comparing the data from the initial conditions, cycle I, and cycle II.

## RESULTS AND DISCUSSION

### Results

This research consists of two cycles. Each cycle goes through four stages, namely: the planning stage, the implementation stage, the data collection stage, and the reflection stage. In each cycle researchers can report as follows:

#### A. Cycle 1

##### 1. Planning

At this planning stage, the activities carried out are determining learning materials. Based on the results of the curriculum study, the material in the first cycle was determined, namely Theme 8, Sub-theme 1 Learning 1 and 2. The focus of the material was Indonesian at KD 3.9. Furthermore, the activity carried out is to develop a learning implementation plan using the RADEC learning model. To complete the learning implementation plan, pre-learning questions are prepared for the Answer stage and student worksheets are prepared for the Discuss stage. Pre-learning questions with student worksheets are similar questions. After that, the activities carried out are arranged HOTS-oriented evaluation questions.

## 2. Implementation

The implementation of each cycle uses the RADEC learning model which is carried out online through the Zoom Meeting and Whastapp applications. The following describes the implementation of the RADEC learning model in the table below.

Tabel 3. RADEC Stage

RADEC Stage	Online Learning
<i>Read</i>	The day before the implementation of the lesson, the teacher provides reading materials and assigns students to read other sources (books, internet) through the WhatsApp Group
<i>Answer</i>	The day before the implementation of learning, the teacher gives pre-learning questions via google form
<i>Discuss</i>	The teacher gives a worksheet in the Whatsapp group which the students then discuss with their friends via the Zoom application.
<i>Explain</i>	Students present their worksheets in a zoom meet
<i>Create</i>	Students make a work from the synthesis of their knowledge after learning (collected after the learning day)

This RADEC stage was carried out twice. After that, students are given the HOTS instrument which measures the skills of creating.

## 3. Observation

The results of observations on the implementation of actions in cycle I can be seen that students are starting to be able to take part in systematic learning during this pandemic, because learning is usually dominated by giving assignments and students sometimes send assignments not according to the agreed time. There are positive things that have been seen since using the RADEC learning model, especially the read stage, namely the level of student participation in reading the material before learning has increased. This can be seen from the number of students who read as many as 17 students. Meanwhile, the rest did not read because they forgot, there is no quota, and there is no gadget.

In addition, in the answer activity the number of students who participated in filling out pre-learning questions was 15 students. On average, the students' answers were correct. This indicates that there are several materials that students can master outside the classroom, so that in the classroom or in learning, students just need to be directed to the material they do not understand. This kind of learning is called the flipped classroom. Thus learning becomes more effective and efficient.

At the discuss stage, because students are still confused about how to have a good discussion in a virtual room, while the discussion is directed to WhatsApp video calls with

friends. After that, students were given time to fill in. For those whose houses are close together, students carry out discussions offline. After finishing the independent discussion in small groups, then everything was directed to enter the zoom meet. In zoom, students return to discussing only the teacher who leads the discussion through question and answer activities about worksheets so that all worksheets are filled in.

Then at the explain stage, students are asked to convey the results of their work on the worksheet. This activity went quite well. Students can correct each other's worksheet answers because previously students already had the knowledge that was obtained at the read and answer stages. So it can be said that presentation activities are more lively and active.

Furthermore, at the create stage, students are asked to make a poster containing the results of the day's learning. The students' responses varied, some were excited because the student liked to draw, some were confused until several times the student made a video call to the teacher. But overall this creation activity went smoothly. The number of students who collected posters the next day reached 30 students, the rest were late. In cycle 1, the HOTS results were quite satisfactory. Here are the data results.

Table 4. Comparison of Student HOTS Cycle 1

Skor	Criteria	HOTS
86-100	Very good	5
71-85	Good	14
56-70	Enough	14
41-55	Not enough	2
< 40	Very less	0
Amount		35

Based on the table above, it can be seen that there are 14 students who get good categories. This number is more than students who get less and very less categories. This indicates that HOTS at level C6 has begun to be developed through the RADEC learning model. This can also be seen from the HOTS-oriented learning process, namely student centered. To more clearly see the success rate of the HOTS data, a table of students' HOTS completeness at level C6 is presented.

Table 5. Completeness of HOTS students Cycle 1

Completeness	HOTS	
	f	%
Complete	19	54,2
Not Complete	16	45,7
<b>Amount</b>	<b>35</b>	<b>100</b>

Based on the data above, it can be seen that there are 19 students who completed. These results confirm that RADEC learning can build students' HOTS level C6..

#### 4. Reflection

Based on the results of the implementation of cycle 1, it appears that not all students follow the read and answer stages. This is a note that all students should follow the learning stages. Furthermore, at the read stage there were activities that were not carried out, namely the provision of a bibliography to make it easier for children to find sources of reading material. Providing a bibliography is also important to encourage children to explore material from various sources. This is what is called multimodal learning. At the answer stage the teacher only assesses it without carrying out feedback on the results of the answers. This feedback is important because students can immediately find out where the error is.

Furthermore, at the discussion stage, it is necessary to give instructions first clearly how to carry out the discussion so that students know the series of activities. Discussions can also try the room breakout feature of the zoom application so that students can be directed with their respective groups. Furthermore, teachers need to improve discussion management skills so that all can participate, considering that the percentage of student involvement in discussions is only 30%. The teacher can ask questions back, give a turn and provide a stimulus so that students dare to have an opinion.

In creating activities, there are still many who are confused when the teacher frees students to create works. Students should be given an understanding first about the importance of expressing creative ideas according to their interests and talents. In addition, the teacher does not supervise all students and the teacher does not provide feedback on student work. Of course there are many shortcomings in the implementation of this RADEC learning model and of course it must be corrected in cycle 2.



From the reflection results, it can be seen that there are several steps in the RADEC learning model that are not implemented properly, this has an impact on the HOTS completeness which is still unsatisfactory because it is only 54.2%. Therefore, it is necessary to carry out cycle 2.

**B. Cycle 2**

**1. Planning**

At the planning stage in cycle 2, there is not much difference from that in cycle 1. However, the results of reflection in cycle 1 require that learning in cycle 2 be carried out with online and offline learning because some students do not have access to devices. The activity carried out is to determine the learning material, which is continued on the material in cycle 1 (still in theme 8). Furthermore, the activity carried out is to develop a learning implementation plan using the RADEC learning model with two learning modes: online and offline. At this stage, learning questions and student worksheets are also prepared as in cycle 1. Finally, the activities carried out are compiling HOTS-oriented evaluation questions.

**2. Implementation**

In contrast to cycle 1, the implementation of the RADEC model in cycle 2 uses online and offline learning patterns because the reflection results state that there are some students who have device limitations. The following describes the implementation of the RADEC model in cycle 2.

**Table 6. Stages of RADEC cycle 2**

<b>RADEC Stage</b>	<b>Online</b>	<b>Offline</b>
<i>Read</i>	The day before the implementation of the lesson, the teacher provides reading materials and assigns students to read other sources (books, internet) through the WhatsApp Group	Students take teaching materials that have been prepared by the teacher at school and then asked to read them at home
<i>Answer</i>	The day before the implementation of learning, the teacher gives pre-learning questions via google form	Students take pre-learning questions that have been prepared by the teacher at school and then asked to do it at home

<i>Discuss</i>	The teacher gives a worksheet in the Whatsapp group which the students then discuss with their friends via the Zoom application.	The teacher gives a worksheet which is then discussed by students with their friends. This activity is carried out in schools with the guidance of teachers.
<i>Explain</i>	Students present their worksheets in a zoom meet	Students present their work on their worksheets
<i>Create</i>	Students make a work from the synthesis of their knowledge after learning (collected after the learning day)	Students make a work from the synthesis of their knowledge at home and then collect it back at school

This RADEC stage was carried out twice. For online students, learning will be held on March 18 and 20, 2021. While offline students are earlier, namely March 17 and 19, 2021 for the Read and Answer (asynchronous) stage and March 19 and 21, 2021 for the Discuss, explain and create stage ( synchronous). Offline students are no more than 5 students who are divided into 2 groups. This offline implementation applies strict health protocols.

### 3. Observation

The results of observations on the implementation of actions in cycle 2 can be seen that students are starting to get used to participating in systematic learning during this pandemic. The level of student participation in reading the material before learning is 33 students. This is an interesting finding because the increase in students' reading is very significant. In addition, in the answer activity the number of students who participated in filling out the pre-learning questions was 33 students. This is a form of flipped classroom learning.

At the discuss stage, the discussion through the breakout room has not yet been carried out because there are non-technical obstacles, so for students who are offline the discussion is carried out using a WhatsApp video call and strengthened in the zoom meeting session. However, in cycle 2, students were used to having discussions, it was seen from the enthusiasm of students in conducting discussions. In addition, students are able to express their opinions without being shy anymore. The point is that students already know what they have to do to carry out a discussion. Likewise, students who are offline, discussion activities become more effective because students have read beforehand about the material.

Then at the explain stage, students began to be more confident in correcting the worksheet answers because previously students already had the knowledge that was obtained at the read and answer stages. So it can be said that presentation activities are more lively and

active. In offline students, students are still shy to present. This is natural because students have not spoken directly in front of their friends and teachers for a long time.

Furthermore, at the create stage, it looks like the student's work is better and the contents of the poster are all correct. Both online and offline students have really enjoyed this create activity. To see the HOTS results in cycle 2, students are given HOTS questions that are different from the questions in cycle 1. The following are the results of students' HOTS in cycle 2.

Table 7. Comparison of Student HOTS Cycle 2

Skor	Criteria	HOTS
<b>86-100</b>	Very good	10
<b>71-85</b>	Good	23
<b>56-70</b>	Enough	2
<b>41-55</b>	Not enough	0
<b>&lt; 40</b>	Very less	0
<b>Amount</b>		<b>35</b>

Based on the data above, we can see that there was a significant increase in the HOTS C6 score, which obtained a good category of 23 students and a very good category of 10 students. To more clearly see the success rate of the C6 level HOTS data in cycle 2, a table of students' HOTS level C6 mastery is presented.

Table 4. Completeness of HOTS students Cycle 2

Completeness	HOTS	
	f	%
Complete	33	94,2
Not Complete	2	0,57
<b>Amount</b>	<b>35</b>	<b>100</b>

Based on the data in the table above, it can be seen that the number of students who completed more than 94.2%. The data means that the number of students who complete is much higher than the number of students who do not complete. This result is actually the impact of

the implementation of each syntax of the RADEC learning model. These results prove that during the pandemic, teachers can still carry out HOTS-oriented learning.

#### **4. Reflection**

Based on the results of the implementation of cycle 2, it can be seen that learning during the pandemic can be carried out in a systematic and structured manner. Although the study room is not in the classroom (face to face), students can follow instructions well. This certainly confirms that during a pandemic, learning can also be interesting and student centered because students can become active students.

Of course, in its implementation there are still many shortcomings, such as in discussion activities that really need to be further matured, both technically and non-technically. Furthermore, students must also be given an understanding of how to have a good discussion through virtual face-to-face.

From cycle 2, we can also see that students' HOTS level C6 can increase even though learning is carried out remotely. This is positive news which in turn becomes a trigger for teachers to create HOTS-oriented learning during the Covid-19 pandemic.

#### **Discussion**

The significant increase in HOTS level C6 cannot be separated from the role of the RADEC learning model which can very well accommodate learning difficulties during the pandemic (Muslim, dkk., 2022). The thing that makes learning during the pandemic difficult is the unpreparedness of education stakeholders in implementing distance learning. Furthermore, the diversity of regional characteristics and economic levels makes not all students able to participate well in learning (BSKAP, 2022). In this case, the RADEC learning model can be applied both online, blended and offline.

Based on the explanation above, the significant increase in HOTS level C6 in each cycle cannot be separated from the stages or syntax of the RADEC learning model which is HOTS-oriented and in accordance with the characteristics of Indonesian students (Pratama, et al., 2019). Based on the results of observations, the characteristics of students in grade IV at SDN Harapan 1 for the academic year 2020/2021 have a very low level of reading awareness before learning. However, by applying the RADEC learning model, 90% of students read before the lesson was implemented. This clearly supports the increase in HOTS where there is a positive effect between HOTS and students who are diligent in reading (Nourdad, et al., 2018).

It is very felt in the learning process that makes students more ready to learn because students already have a stock of concepts and materials before carrying out learning. This can be seen in the learning process where students seem to have mastered the learning material. Good mastery of the material can help build students' HOTS level C6. This is in accordance with Tuba's (2017) statement which states that reading activities are very important and must be included in the core learning process so that learning can be carried out more effectively and meaningfully. Furthermore, reading strategies are a key element in developing students' understanding (Hülya Küçükoğlu, 2012). In addition, through reading activities students can improve their skills in understanding the content of reading. Understanding the contents of this reading is a suitable tool to achieve critical thinking skills (HOTS) (Khatib, Mohammad & Mehrgan, Kamran, 2012).

To see student feedback at the Read stage, the next stage is Answer. At this stage the teacher gives pre-learning questions. Pre-learning questions contain questions that have been adjusted to indicators of competency achievement. This question is important because in developing students' HOTS, teachers need good questioning techniques (Limabch & Waugh, 2010), and questioning techniques can be included in pre-learning questions. Furthermore, question and answer is a productive teaching approach in stimulating critical thinking (HOTS) (Rashid, Sumaira & Shahzada, 2016), this critical thinking is clearly another form of HOTS. Through the questioning process the teacher can monitor how student competence is (Musingafi, et al. 2014), so that the Answer stage can show the teacher that before learning begins students have understood the material and mastered several indicators well. Then the next learning process can be focused on things that have not been understood by students, and this is what is called effective learning.

Furthermore, at the Discuss stage, it was seen that students were active and eager to discuss worksheets both online and offline. In the worksheet, pre-learning questions are inserted so that students can correct each other against the answers in pre-learning questions. Active discussion occurs because the previous students already have sufficient material to discuss problems. An active discussion process like this certainly encourages students to ask questions and learn to use problem-solving strategies, this is what can build HOTS (Petrovska & Veselinovska, 2013). This is in line with the research of Murphy, et al. (2014) who concluded that critical-analytical skills can be built through challenging discussions or conversations.

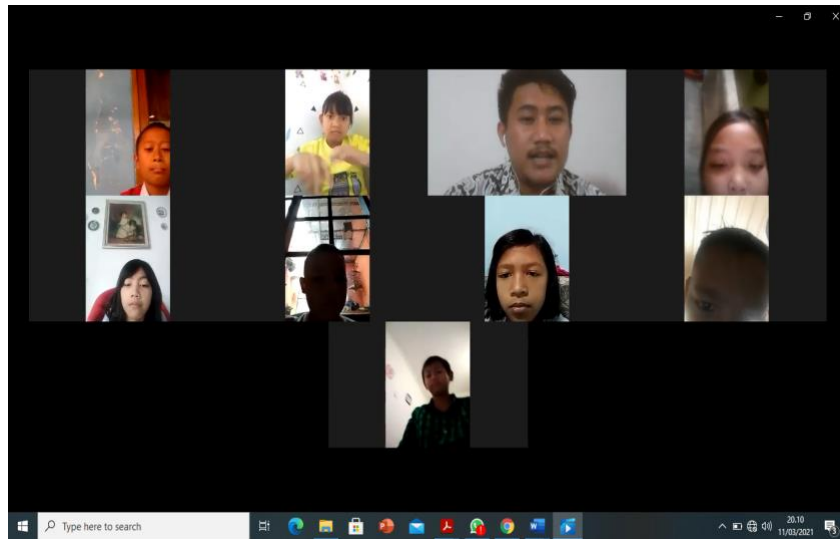


Figure 1. Cycle 1 virtual discussion activities

This significant increase in HOTS is also influenced by the Explain stage where students here will develop HOTS, more specifically evaluation skills which in the revised Bloom's taxonomy enter the C5 realm through a communicative learning process. The communicative learning process has proven to be good in training students to think, this is evidenced by Jabeen's (2014) research in learning English. HOTS will be built at this stage when students assess each other by responding to the results of discussions from other groups. In providing a response, of course, a higher-order thinking process is needed, namely assessing or comparing. The explain process is almost like the demonstration stage on the quantum learning model which is also successful in building HOTS (Pratama & Solehuddin, 2019).

The Explain activity which requires this communication to occur should be an integral part of innovative learning as contained in the syntax of the inquiry learning model which has been proven to be able to develop HOTS (Duran & Dokme, 2016; Suryaningsih, et al., 2016), but the presentation stage (Explain) in RADEC learning model is more interactive and communicative. Indicators of interactive and communicative presentations are seen in this study, such as the occurrence of cross opinions and the number of students who dare to express their opinions.

Furthermore, the final stage in the RADEC learning model, namely Create, is clearly able to develop HOTS, because the highest level of HOTS is to create. This stage will help develop students' creative ideas to be further realized in the work of both products and projects, in this research the work made is a product in the form of a poster. This activity is held after the day of learning (discuss and explain). This is done so that students are more mature what

works are made after learning is complete. In this case, the teacher does not limit what types of work students must make. The following is an example of student work.



Figure 2. The creation of the Create stage

The process of making creative ideas at the create stage is very interesting to note because students are really enthusiastic about the process. This can be seen from the number of students who sent posters and everything was on time. Through such product (poster) concepts, in addition to making the educational environment more effective, of course HOTS will also be built (Sasson et al., 2018). More specifically, Fatimah (2018) states that work-based learning, both projects and products, has a positive influence on student creativity. Thus, the create stage in the RADEC learning model supports increasing students' HOTS level C6.

The results of this study clearly show that there is a significant increase in students' HOTS after obtaining learning using the RADEC learning model. This is in line with the research of Sopandi et al. (2019) which concluded that 100% of the participants of primary and secondary education teachers in West Java stated that the RADEC learning model could train students' creative thinking skills, critical thinking, and problem solving. In line with that, the research of Pratama, et al. (2019) also concluded that the RADEC learning model can build critical thinking skills of Indonesian students. Lastly, research by Agustin, et al. (2021) also concludes that the RADEC learning model can increase HOTS for both students and students.

The increase in HOTS level C6 through the RADEC learning model is increasingly convincing that the RADEC learning model can be used as an alternative solution to the lack of success of other innovative learning models in the Indonesian context, more specifically during the Covid-19 pandemic. Besides being able to accommodate 21st century skills such as HOTS and 4C (Critical thinking, collaborative, communicative, and creative thinking) (Sopandi, et al., 2019; Pratama, et al., 2020; Agustin, et al., 2021), the RADEC learning model has a syntax that flexible and adaptive both online, blended, and offline so that it is very easy to apply during the Covid-19 pandemic. In addition, the suitability of the characteristics of

Indonesian students and the syntax that is easy for teachers to memorize, makes the RADEC learning model more grounded and easy to implement.

The successful implementation of online learning through the RADEC learning model has become a breakthrough during the pandemic. This classroom action research breaks the notion that the implementation of learning during a pandemic cannot build HOTS. In addition, the problem regarding the lack of publication of the increase in HOTS during the pandemic caused by the difficulty of other innovative learning models being implemented during the pandemic, can be solved by the RADEC learning model which is a learning model created by the nation's children.

## **CONCLUSION**

Based on the above study, the conclusion from this classroom action research is that there is a significant increase in students' HOTS level C6. This can be seen from the number of students who completed in cycle 1 as many as 19 students, while in cycle 2 it increased significantly, namely as many as 33 students. So the conclusion is that online learning through the RADEC learning model is effective in increasing HOTS level C6 for fourth grade students at SDN Harapan 1 for the 2020/2021 academic year during the Covid-19 pandemic.

This research is expected to provide an alternative HOTS-oriented learning that is easy to implement during a pandemic, namely using the RADEC learning model. The RADEC learning model needs to be continuously supported by teachers by implementing it at the primary, secondary and higher education levels. This is important considering that this model is still new and needs a lot of developments in practice.

## **ACKNOWLEDGMENTS**

The researcher would like to thank SDN Harapan 1 for being willing to be partners in the research. Furthermore, the researcher would like to thank PUSLAPDIK through the Indonesian education scholarship for providing support for the implementation of this research. Finally, the researcher would like to thank the lecturers in the UPI curriculum development study program who have provided knowledge that is very useful for me and certainly helped me in constructing research.



## REFERENCES

- Abdullah, AH, dkk.. (2017) Mathematics Teachers' Level of Knowlegde and Practice on the Impementation of Higher-Order Thinking Skills (HOTS). *Journal of Mathematics*
- Agustin, M., Pratama, Y. A., Sopandi, W., & Rosidah, I. (2021). Pengaruh Model Pembelajaran RADEC Terhadap Keterampilan Berpikir Tingkat Tinggi Siswa PGSD, *Jurnal Cakrawala Pendas*, Vol. 7, No. 1
- Binkley, M., dkk. (2012). "Defining Twenty-First Century Skills" dalam *Assessment and Teaching of 21st Century Skills*. New York: Springer.
- Brookhart, S. M. (2010). *How to Assess High-er Order Thinking Skills in Your Class-room*. Alexandria: ASCD
- BSKAP. (2022). *Kajian Akademik Kurikulum Untuk Pemulihan Pembelajaran*. Jakarta: Kemendikbudristek
- Chiang, C. L., & Lee, H. (2016). The Effect of Project-Based Learning on Learning Motivation and Problem-Solving Ability of Vocational High School Students, *International Journal of Information and Education Technology*, 6(9). <http://doi.org/10.7763/IJET.2016.V6.779>
- Duran, M. & Dökme, I. (2016). The effect of the inquiry-based learning approach on student's critical-thinking skills, *Eurasia Journal of Mathematics, Science & Technology Education*, 12(12), hlm. 2887-2908. doi: 10.12973/eurasia.2016.02311a
- Fatimah, S. (2016). The Effect of Project Based Science Learning on PGSD Students ' Creative Thinking Ability, *Jurnal Pendidikan Indonesia*. 7(2), hlm. 100–105. DOI : 10.23887/jpi-undiksha.v7i2.13018
- Fitrianawati, M., Maharani, E. A., Pramudyani, A.V.R. (2020). Peningkatan kualitas pembelajaran aktif berbasis HOTS bagi guru di Kecamatan Tempel di era pandemi Covid-19, *Prosiding Seminar Nasional Hasil Pengabdian kepada Masyarakat Universitas Ahmad Dahlan 2020*, Hlm. 625-630
- Genc, M. (2014). International Research in Geographical and Environmental Education The project-based learning approach in environmental education, (February 2015), 37–41. <http://doi.org/10.1080/10382046.2014.993169>
- Gunawan, Sahidu, H., Harjono, A. & Suranti, N. M. Y. (2017). The Effect Of Project Based Learning With Virtual Media Assistance On Student's Creativity In Physics, *Cakrawala Pendidikan*. Th. XXXVI, No. 2, hlm. 167-179
- Hugerat, M. & Kortam, N. (2014). Improving Higher Order Thinking Skills among freshmen by Teaching Science through Inquiry. *Eurasia Journal of Mathematics, Science & Technology Education*, 2014, 10(5), hlm. 447-454.

- Hülya Küçükoğlu, (2012). Improving reading skills through effective reading. kdeniz Language Studies Conference 2012. Procedia - Social and Behavioral Sciences 70 (2013) 709 – 714 doi:10.1016/j.sbspro.2013.01.113
- Ilham, S. M., Kune, S. & Rukli. (2020). The Effect of Radeç's Learning Model Assisted by Zoom Application on Science Critical Thinking Ability during Covid-19 Pandemic Era, *Indonesian Journal of Primary Education*, 4 (2), hlm. 174-183
- Jabeen, Shazi S. (2014). Implementation Of Communicative Approach, *English Language Teaching*, 7(8), Hlm. 68-74
- Jumanto, Sopandi, W., Kuncoro, Y., Handayani, H., & Suryana, N. (2018). The Effect Of Radeç Model And Expositorial Model On Creative Thinking Ability In Elementary School Students In Suralaya. Dalam Syaodih, Sujana, Handayani & William (Penyunting). *Prosiding International Conference on Elementary Education* (hlm. 561-567). Bandung: Universitas Pendidikan Indonesia.
- Khatib, M. & Mehrgan, K. (2012). *Advances in Digital Multimedia (ADMM)* 166 Vol. 1, No. 3, 2012, ISSN 2166-2916
- Kusuma, M. D., Rosidin, U., Abdurrahman, & Suyatna, A. (2017). The Development of Higher Order Thinking Skill (HOTS) Instrument Assessment In Physics Study, *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 7(1), hlm. 26-32, DOI: 10.9790/7388-0701052632
- Limbach, B & Waugh, W. (2010). Developing Higher Level Thinking. *Journal of Instructional Pedagogies*. 12 (1), hlm. 1-9
- Lukmanudin. (2018). Penguasaan Konsep IPA dan Kemampuan Menjelaskan Perpindahan Zat Pencemar Siswa PGSD melalui Pembelajaran *Read-Answer-Discuss-Explain-and Create*. (Tesis). Jurusan Pendidikan Dasar Sekolah Pascasarjana Universitas Pendidikan
- Madhuri , V. S.S.N Kantamreddi & L. N.S. Prakash Goteti (2012). Promoting higher order thinking skills using inquiry-based learning, *European Journal of Engineering Education*, 37(2), hlm. 117-123
- Maryani, I. & Martaningsih, S. T. (2020). Motivasi guru sekolah dasar pada pelatihan pengembangan alat evaluasi berorientasi HOTS dalam pembelajaran jarak jauh di masa pandemi covid 19, *Prosiding Seminar Nasional Hasil Pengabdian kepada Masyarakat Universitas Ahmad Dahlan 2020*, Hlm. 789-798
- Murphy, P. Karen, Rowe Meredith L., Ramani, G. & Silverman, R. (2014). Promoting Critical-Analytic Thinking in Children and Adolescents at Home and in School, *Educ Psychol Rev*, 26, hlm. 561–578. DOI 10.1007/s10648-014-9281-3
- Musingafi, Chando, M. C. & Muranda, Enety, K. (2014). Students and Questioning: A Review of the Role Played By Students Generated Questions in the Teaching and Learning Process. *Studies in Social Sciences and Humanities*. 1(3), hlm. 101-107
- Muslim, F., Putra, I., Nasori, A. (2022). Desain Pembelajaran Adaktif Berbasis Vicon melalui Model Radeç bagi Peserta Didik yang Kesulitan Belajar Selama Pandemi Covid-19,

- Edukatif : Jurnal Ilmu Pendidikan*, 4 (1), hlm. 7 – 18.  
DOI: <https://doi.org/10.31004/edukatif.v4i1.1660>
- Nourdad, N., Masoudi, S., & Rahimali, P. (2018). The Effect of Higher Order Thinking Skill Instruction on EFL Reading Ability, *International Journal of Applied Linguistics & English Literature*, 7(3), hlm. 231-237.  
<http://dx.doi.org/10.7575/aiac.ijalel.v.7n.3p.231>
- Nugroho, R. A. (2018). *HOTS (Kemampuan Berpikir Tingkat Tinggi: Konsep, Pembelajaran, Penilaian, dan Soal-soal)*. Jakarta: PT Gramedia Widiasarana Indonesia
- OECD. (2017). *Educational Opportunity for All*. <https://doi.org/10.1787/9789264287457-en>
- OECD. (2013). *PISA 2012 Results: What Students Know and Can Do Student Performance in Mathematics, Reading and Science Volume I*.
- Petrovska, S., & Stavreva, S. (2013). *Contemporary Pedagogical Approaches for Developing Higher Level Thinking on Science Classes. Procedia - Social and Behavioral Sciences*, 92(Lumen), 702–710. <http://doi.org/10.1016/j.sbspro.2013.08.742>
- 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 (IJEVS)*, )DOI: <https://doi.org/10.29103/ijevs.v1i2.1379>
- Pratama, Y. A. & Solehuddin, M. (2019). Effect Of Quantum Learning Model On Higher Order Thinking Skills In Grade 4th Elementary School, 253(Aes 2018), 396–400.
- 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.  
<https://doi.org/10.22219/jinop.v6i2.12653>.
- Pratiwi, N., Sopandi, W., & Rosdiono, M. (2018). The Students ' Conceptual Understandings On Global Warming Through Read-Answer-Discuss-Explain-And Create (RADEC) Learning. Dalam Syaodih, Sujana, Handayani & William (Penyunting). *Prosiding International Conference on Elementary Education* (hlm. 635–639). Bandung: Universitas Pendidikan Indonesia.
- Rashid, Sumaira & Shahzada, Q. (2016). Developing Critical Thinking through Questioning Strategy among Fourth Grade Students. *Bulletin of Education and Research*. 38(2), hlm. 153-168
- Sasson, I., Yehuda, I., & Malkinson, N. (2018). Fostering The Skills Of Critical Thinking And Question-Posing In A Project-Based Learning Environment, *Thinking Skills and Creativity*. <http://doi.org/10.1016/j.tsc.2018.08.001>
- Schoenbach, R., & Greenleaf, C. (2017). Leading for literacy. *Phi Delta Kappan*, 99(3), hlm. 59–64.  
doi:10.1177/0031721717739596

- Sopandi, W. (2017). the Quality Improvement of Learning Processes and Achievements Through the Read-Answer-Discuss-Explain-and Create Learning Model Implementation. Dalam C. M. Keong, L.L. Hong, & R. Rao (Penyunting), *Proceeding 8th Pedagogy International Seminar 2017*, 8, 132–139. Kuala Lumpur: Institut Pendidikan Guru Kampus Ilmu Khas
- Sopandi, W. & Handayani, H. (2019). The Impact Of Workshop On Implementation Of (RADEC) Learning Model On Pedagogic Competency Of Elementary School Teachers, 178(Icoie 2018), hlm 7-11.
- Sopandi, W., Pratama, Y. A., & Handayani, H. (2019). Sosialisasi dan Workshop Implementasi Model Pembelajaran RADEC Bagi Guru-Guru Pendidikan dasar dan Menengah, *Pedagogia: Jurnal Pendidikan*, 8 (1), hlm. 19-34.
- Suryaningsih, N. M. A., Cahaya, I. M. E., Poerwati, C. E. (2016). Implementasi Pembelajaran Inkuiri Terbimbing Berbasis Permainan Dalam Meningkatkan Kreativitas Anak Usia Dini, *Jurnal Pendidikan Indonesia*, 5(2), hlm. 212-220
- Tembang, Y. Sulton, & Suharjo. (2017). Peningkatan Motivasi Dan Hasil Belajar Melalui Model Pembelajaran Think Pair Share Berbantuan Media Gambar Di Sekolah Dasar. *Jurnal Pendidikan Universitas Negeri Malang*. 2(6), hlm. 812-817.
- Trilling, B. & Fadel, C. (2009). *21st Century Skills: Learning for Life in Our Times*. San Francisco: Jossey-Bass A Wiley Imprint.
- Tuba, Şengül Bircan. (2017). A study on reading habits of social studies and history teachers in Turkey, *Educational Research and Reviews*, 12(10), hlm. 569-582.DOI: 10.5897/ERR2017.3245
- Yuliati, L., Riantoni, C. & Mufti, N. (2018). Problem Solving Skills on Direct Current Electricity through Inquiry-Based Learning with PhET Simulations. *International Journal of Instruction*, 11(4), hlm. 123-138.