ICEE-2

The Application of Read-Answer-Discuss-Explain-and Create (Radec) Models to Improve Student Learning Outcomes in Class V Elementary School on Human Respiratory System

Dian Sukmawati✉[1], Wahyu Sopandi[2], and Atep Sujana [3]

[1,2,3,4] Department of Elementary Education, School of Postgraduate Studies, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No.229 Bandung 40154, Indonesia.
✉ [1]diansukmawati@upi.edu, [2]wsopandi@upi.edu, [3]atepsujana@upi.edu

Abstract. This study aims to improve the learning outcomes of students of class V SDN Sukaraja I related to the concept of human respiratory system through the RADEC model. The research subjects consisted of 34 students. The research method used is Classroom Action Research. The instruments used were tests and non-tests. The test instrument was arranged to measure student learning outcomes. Non-test instruments are used to determine the feasibility of learning. The data obtained consisted of qualitative and quantitative data. Qualitative data were analyzed descriptively while quantitative data were analyzed by finding averages and percentages of achievement in each cycle. This research was validated using triangulation techniques. The results showed that RADEC was able to improve student learning outcomes on the topic of the human respiratory system. This is evidenced by the change in the achievement of students' learning outcomes. In the preliminary data, around 40% or as many as 14 students have reached completion. In the first cycle, an increase in completeness reached 65%, or as many as 22 students achieved completeness. In the second cycle there was also an increase in completeness which was around 90% or as many as 31 students had reached completeness.

Keywords: Classroom Action Research, human respiratory system, learning outcomes, RADEC.

INTRODUCTION ~ The 21st century is often referred to as the golden age for science and technology, where modern society has succeeded in developing its ability to overcome various problems of its life. 21st century conditions also provide rapid changes to the learning environment (Ivanova, 2016), so education must be oriented to the competencies needed such as creative thinking skills, critical thinking, metacognition thinking, communication, collaboration, digital literacy, citizenship, work and career, and skills individual and social responsibility (Binkley, 2012). This statement is in line with what was stated (Trilling, 2009), that the concept of skills and knowledge that must be developed in the 21st century includes learning and innovating skills in which there are creative thinking and problem solving abilities, communication and collaboration skills, and the ability to be creative and innovating. These skills become essential to be developed and familiarized from an early age so that every individual has the readiness to live life in the 21st century.

Schools become one of the institutions that can be used as a forum to develop these skills through activities studying topics that are contained in various subjects. Sciences (IPA) is one of the subjects at the elementary school level. Science learning in elementary schools is the initial foundation in producing students who have scientific knowledge, skills and attitudes. Viewed from a holistic perspective, science should be seen as a way of thinking, a way of investigating, as

well as a body of knowledge (Sujana, 2014).

In accordance with the curriculum in Indonesia, elementary school students must conceptually understand the topics contained in science subjects and develop the skills needed in the 21st century. Science learning in the 21st century must be able to develop students' higher order thinking skills (HOTS). HOTS has become an important theme that requires a program to redesign and reform the learning system (Saido, 2015). It is important to carry out learning that aims to improve the ability to think and reason, so students are able to answer questions or solve more complicated problems (Fitri, 2018). This is in line with opinions (Nachiappan, dkk. 2018), HOTS can be developed and familiarized through the implementation of daily teaching and learning activities by implementing strategies to implement, analyze, evaluate, and create.

Facts on the ground show that the ability to think at a higher level has not been a teacher's main focus in teaching. One problem in learning science in primary schools is the weak implementation of learning that is able to develop students' thinking abilities (Susanto, 2014). That means the scientific approach that is recommended to be implemented in 2013 curriculum-based learning activities is still not effective in improving students' thinking skills. Many factors cause Indonesian students to lose their intellectual power, but what is seen significantly is that Indonesian students tend to learn to use methods that do not foster higher-order thinking skills. The ability to think at a higher level can be developed by reducing teacher intervention in directly informing the topic of the material being studied to students. Instead, students are given more opportunities to explore independently to deeply understand the topic of the material being studied. The role of the teacher in learning, ideally becomes a facilitator and director of the implementation of learning activities so that communication in learning can occur in both directions between the teacher and students optimally.

Research conducted by (Saido, 2019) shows that teachers tend to teach students to memorize concepts, while problem-based, collaborative and inquiry-based learning is less implemented by teachers. These results are in line with research Sopandi, et al. (2017) in a workshop on innovative learning models which found that teachers tend not to understand the syntax of innovative learning models that have been known so far so that conventional models remain the mainstay of teachers in teaching students. Classroom activities that are dominated by assignment and memorization activities also have an impact on the low involvement of students' thinking skills in learning (Tembang, 2017). There is still a lot of material that only survives on short term memory, so the

thinking ability of students in Indonesia, some of which only reach the phase of remembering, restating, or referring without doing processing (Nugroho, 2018). This has implications for assessments that are also unsatisfactory, because the achievement of objectives is far from expected.

In line with Constitution No. 14 of 2005 concerning teachers and lecturers which states that a teacher must have the ability to realize national education goals and are obliged to improve and develop academic qualifications and competencies in a sustainable manner in line with the development of science, technology, and art. A teacher must always update his knowledge, especially in the 21st century the teacher must be a lifelong learner. One way to improve the quality of learning is by applying innovative learning models that are developed theoretically and empirically.

The learning model is one of the important components that support the success of the learning process, so that the learning model continues to develop in an effort to improve the quality of education and the quality of learning. The ability of teachers to design learning that is able to optimize student learning outcomes is the key to achieving learning objectives. However, in practice, this innovative learning model is very less used by teachers in learning. The results of the study (Sopandi, et al. 2018) stated that only 10% of elementary and secondary education teachers in West Java could write the syntax of the most commonly used innovative learning model, the rest teachers did not understand and could not rewrite the syntax or the teacher could say feel implementing an innovative learning model, even though the fact is not. Furthermore, the preparation of innovative learning models adopted from the west sometimes still does not suit the Indonesian context. One of them is the problem of Indonesian students' low interest in reading, while quite a lot of government examinations are held and must be followed by students. So in the context of Indonesia, it is necessary to have a learning model that is not only able to improve the competence of the 21st century, but can also build a culture of literacy and prepare students for the tests held by the government. Preparing students for exams naturally by implanting material in accordance with the applicable curriculum. Considering the amount of material that must be covered by students is quite a lot, but the limited learning time in schools makes these conditions are not accommodated by innovative learning models from the west.

Therefore, the researcher has an alternative learning model to improve student learning outcomes on human respiratory system material through the Read-Answer-Discuss-Explain and Create (RADEC) learning model. The RADEC learning model is one alternative learning model that is suitable for Indonesian conditions (Sopandi, 2017). This model was

first introduced at an international conference in Kuala Lumpur, Malaysia. The name of this model is adjusted to the syntax of learning activities that will be carried out, namely Read, Answer, Discussion, Explain, and Create (RADEC). The syntax of the RADEC model is easily memorized by elementary and secondary education teachers (Sopandi, 2018), so it is appropriate to be used as an alternative to innovative learning models in Indonesia. Besides being easily memorized in syntax, this model is present on the basis of the Indonesian education system which requires students to understand many concepts of science in a limited time. This model is the latest breakthrough in education that wants achievement of various aspects of 21st century competence, character, and literacy accompanied by preparation for examinations held by schools or universities. Several studies have proven that the RADEC learning model has a positive impact on learning outcomes, both material-oriented namely conceptual understanding, and those oriented towards learning skills, namely the ability to think creatively (Jumanto, 2018).

Based on the background that has been described above, this study wanted to see the effect of RADEC learning on student learning outcomes. This study describes the planning of learning activities with the RADEC learning model, the implementation of human respiratory system learning using the RADEC learning model, and the enhancement of student learning outcomes in the human respiratory system after participating in learning with the RADEC model.

METHOD

This research used classroom action research (CAR). The subjects of this study were fifth grade students at SD Negeri Sukaraja I. There were 29 students consisting of 16 men and 13 women. The procedure for carrying out data collection consists of four stages, namely the planning stage, the implementation of actions, observation and reflection Kemmis dan Taggart (Kusumah and Dwitagama, 2010). This research was validated using triangulation techniques and data collection which was carried out through several cycles (Creswell, 2015; Gall, Gall, dan Borg, 2010).

Data collection techniques carried out by observation, interviews, tests, and documentation. Observation was carried out when implementing the RADEC learning model in class using observation guidelines and field notes. The instruments used to collect data were observation sheets, interview guides, conceptual understanding test about the human respiratory system, field notes sheets, and cameras. Data obtained from the reading comprehension test were analyzed quantitatively using Ms. Office Excel. Data obtained through observation, field notes, and interviews were analyzed descriptively qualitatively.

RESULTS

Initial Condition Description

Initial conditions based on observations on Thursday, August 15, 2019, there are still many students in class V of SDN Sukaraja I who do not understand the material about the human respiratory system. Out of 34 students, 20 of them achieved grades below the minimum criteria of mastery learning (KKM). Apart from that, student activity is still low, almost 50% of the total number of students still pays little attention to teachers when participating in learning activities.

Description of Cycle I

Planning

Based on preliminary findings in class V, the researcher drew up an action plan in the form of a lesson plan in which learning activities applied RADEC. In addition, prepare the observation sheets and the evaluation questions as a test tool.

Acting and Observing

Implementation of Cycle I was carried out on Tuesday, August 20, 2019. The learning steps that had been prepared were then implemented. The steps are in accordance with the syntax sequence of the RADEC learning model, namely:

(1) Read, this step is carried out in pre-learning. Students are assigned to read at home before. The reading material is adjusted to what is in the student's book about the material of the human respiratory system.

(2) Answer, this step is carried out by equipping students with questions to find answers after reading. This step is still implemented in pre-learning activities.

(3) Discuss, this step is carried out by arranging students to discuss in groups. This step provides an opportunity for students to discuss each other's answers with other members in one group. In this step, the teacher must ensure that there is communication between students in each group to get the correct answer or job. By looking at the activities of the whole group, a teacher can also determine which group or who is mastering the teaching material being studied. In this way the teacher can also know which groups or who already have creative ideas as a form of applying the concepts that have been mastered.

(4) Explain, this step directs students to carry out classical presentations. Teaching material presented includes all indicators of cognitive learning aspects about the human respiratory system that have been formulated when planning learning implementation with the RADEC model. The order of presentation is adjusted according to the sequence of learning indicators formulated in the lesson plan. In this step student representatives who have mastered learning indicators explain important concepts in front of the class. In this activity also, the teacher ensures that what is explained by the presenter is scientifically correct and other students understand the explanation. In this activity

the teacher also encourages other students to ask questions, refute, or add to what their friends have said from other groups.

(5) Create, the teacher inspires students to learn to use the knowledge they have mastered to produce ideas or creative thoughts in making mind mapping images of the respiratory system in humans.

Reflecting

Analysis and reflection are carried out after the learning activities are completed. At this stage, the findings show that the learning activities of students are still lacking and there are still those who do not understand the material of the human respiratory system. This is evident from the results of the final test, about 12 people received grades less than the minimum criteria of mastery learning (KKM). Therefore, it is necessary to carry out repairs in the next cycle.

Description of Cycle II

Planning

Based on the findings in cycle 1, the researcher drew up an action plan again in the form of a learning plan and prepared teaching materials.

Acting and Observing

At this stage, researchers carry out learning activities which steps are still the same as at cycle 1. Based on the final outcome data, it can be interpreted that of 34 students, 31 of whom have reached or more than the minimum criteria of mastery learning (KKM), and only 3 more people haven't.

Reflecting

Because the test results have reached 90% completeness, it is not continued to the next cycle of action.

DISCUSSION

Based on the results of the analysis in Cycle I and Cycle II, it was found that the RADEC learning model can be used to improve students' understanding of the human respiratory system. This is in line with research conducted by Jumanto, et al. (2018) that RADEC can be used to improve students' understanding of learning material. RADEC is also effective for use in science learning at the elementary school level. Like the results of research conducted by Sopandi, et al. (2017), the syntax in the RADEC model is more effective and easy to remember by the teacher when implemented in learning. RADEC is also able to facilitate the ability of students to collaborate with their friends through mutual confirmation activities at the stage (asking) the results of investigations that have been carried out by each of them in advance in the stage (read) deeply. Thus, in addition to helping to improve students' conceptual understanding skills, the syntax in RADEC that is able to create a collaborative and investigative climate during learning is also able to assist students in developing the abilities needed in the 21st century (Saido et al. 2015; Tembang, 2017; Nugroho, 2018).

CONCLUSION

Based on the analysis of data collected in the study, the following conclusions are obtained.

1. In the preliminary data, around 40% or as many as 14 students have completed mastery and around 60% or as many as 20 students have not reached completeness.

2. In the first cycle, an increase in completeness is achieved, which is about 65% or as many as 22 students achieve completeness and around 35% or as many as 12 students have not achieved completeness.

3. In the second cycle there is also an increase in completeness which is about 90% or as many as 31 students have reached completeness and around 10% or 3 students have not reached completeness.

Thus, the application of RADEC in science learning activities can improve student learning outcomes related to human respiratory system material.

ACKNOWLEDGMENT

The author would like to thank the lecturers, who always guide and assist the smooth running of the research and all those who cannot be mentioned one by one who have provided assistance in the preparation and completion of this research article.

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