RADEC LEARNING DESIGN MODELTO TRAIN THE 21st CENTURY SKILLS IN ELEMENTARY SCHOOL

Nanang Rosid Abidin[1], Eko Andy Purnomo[2], Venissa Dian Mawarsari[2]
[1] Sekolah Dasar Muhammadiyah Sudagaran, Wonosobo, Jawa Tengah
[2] Pendidikan Matematika, Universitas muhammadiyah semarang

Abstract. Changes in the orientation of 21st-century education by training soft skills are of particular concern to the world of education. Revise the 2013 curriculum by adding skills (1). Critical Thinking and Problem-Solving; (2) Creativity and Innovation; (3) Communications; (4) Collaboration that is included in each learning content gives a message about the importance of this skill. This was done because Indonesia's low position in the PISA ranking based on the Education Development Index released in 2016 was ranked 61, 62, and 63 out of 72 countries for the fields of science, reading, and mathematics. Facts on the ground, teachers are still not well prepared for learning. Conventional teaching methods with lectures and teacher-centered are still the favorites. Answering these challenges, lesson design using a learning model (Read, Answer, Discuss, Explain, Create) RADEC can be used as an alternative solution to train 21st-century skills in elementary schools. The research model used is descriptive qualitative from the results of observations, documentation, and interviews. The results showed that students were trained to analyze critical thinking, creativity, and innovation, to communicate and collaborate well at the stages of the RADEC learning model. Students are more active and interested in learning, it is easier to understand the material and get satisfactory results.

Keywords: RADEC, 4C, lesson design

INTRODUCTION

21st-century education has experienced a real change, its orientation is not just a cognitive domain but has begun to lead to training the soft skills needed to compete in the future era. Responding to this, Susanti & Arista (2019) stated that the 2013 curriculum was renewed by incorporating critical thinking and problem-solving skills, creativity and innovation, communication, and collaboration. This fact shows that soft skills are a demand to face the industrial revolution 4.0. The 21st-century skills needed do not become certain subjects but are included in the learning process of every lesson content delivered by the teacher.

Based on this, it can be formulated that the development of students' soft skills must have a conceptual framework: (1) integrated with the teaching and learning process, the teacher designs events in the learning process in the classroom to familiarize students with the ownership of the required soft skills; (2) habituation (habituation) through students' daily activities in the school environment, the teacher designs all daily activities, both routine and condition, including all encounter moments; (3) integrated into all extracurricular activities and daily activities at home, teachers need to design partnerships with parents.(Samad & Suardi, 2020)

However, the facts on the ground, according to Suryanti (2017) in his research, stated that in 2011, based on the Education Development Index (EDI), Indonesia was in 69th position out of 127 countries (achievement-iief.org: 2013). Indicators of the low quality of education in Indonesia are the low PISA scores of Indonesian students, the low quality of teachers seen from the Teacher Competency Test (UKG) scores, limited access to education, inadequate facilities in many schools, and the number of dropouts or even no school. due to various factors. As reported by the Organization for Economic Co-operation and Development (OECD) that the results of the 2015 PISA test and survey released in December 2016 stated that the average achievement score of Indonesian students in the fields of science, reading, and mathematics was successively. also ranked 62, 61, and 63 out of 72 countries. For the ASEAN level, Singapore won various aspects and assessment indicators, and even Vietnam and Thailand ranked above Indonesia.

These 21st-century skills are important for educators to know so that they can be applied in the teaching and learning process. But in reality, as stated in the research of Munawaroh et al. (2018) one of the causes of the low ability of 21st-century skills, teachers still use traditional models such as questions and answers, assignments, and lectures. This makes students bored and bored with the model used by the teacher. Because of the current needs, students are more challenged to explore independently in training higher-order thinking processes.

A similar thing happened at SD Muhammadiyah Sudagaran Wonosobo, based on the results of interviews, not all teachers were ready for the changes and challenges of the 21st century, it was proven that the learning process and learning model were not optimal so that students were not accustomed to critical thinking during learning, did not develop creativity, lacked collaboration and did not maximize good communication.

Responding to the current learning challenges where 4C competencies and literacy are needed, a learning model that is easy in practice and syntax is needed. The RADEC (Read, Answer, Discuss, Explain, and Create) model is one of the recommendations for a learning model that can be applied because it is easy to understand and do. With the thematic media models and innovations, it is hoped that educators can practice 21st-century skills (Handayani et al., 2019).

RESEARCH METHODS

The research was carried out on class VI students of Ar Rahman SD Muhammadiyah Sudagaran Wonosobo. The method developed is descriptive qualitative. This research is identified as appropriate for research questions that focus on finding who, what, and where events or experiences to gain insight from informants about a desired phenomenon or information sought to develop and refine questionnaires (Kim et al., 2017).

Data collection was obtained in the preliminary "*Kenapa Begitu*" process, the core activity "*Oh Begitu*", and the "*Jadi Begitu*" evaluation. The retrieval technique uses the methods of documentation, interviews, discussions, and field notes. The observer in this study was a teacher at SD Muhammadiyah Sudagaran Wonosobo. Assessment is directed at changes in activity that occur in class VI Ar Rahman students. Documentation and observation data are grouped and then described as needed.

DISCUSSION

This research was conducted at SD Muhammadiyah Sudagaran Wonosobo. The activity was followed by a model teacher and 2 observer teachers from SD Muhammadiyah Sudagaran Wonosobo. The discussion will analyze each syntax of the RADEC learning model in lesson design, which consists of Read, Answer, Discuss, Explain, and Create. The analysis leads to the findings of 21st-century skills according to Sunismi et al., (2020) on 4Cs skills which include 1) Critical thinking; 2) Creativity; 3) Communication; and 4) Collaboration. The reason for research using lesson design in lesson study programs according to research by Winaryati dan Alfiah (2019) is proven to improve the quality of learning.

Students will be trained in 21st-century skills when in the learning process they gain knowledge, attitudes, and skills that can be applied in everyday life. Through the collaboration of model teachers and observers, various and complete information and experiences will be produced.

a. Implementasi *Lesson Design* dengan Model Pembelajaran RADEC

Implementasi dilakukan oleh peneliti sebagai guru model. Materi yang digunakan pada *lesson design* menggunakan model pembelajaran RADEC ini adalah materi kelas VI SD pada Tema 3 Subtema 3 "Ayo Jadi Penemu". Peneliti berkolaborasi dengan dua guru observer dalam melakukan penelitian ini. Tahapan *lesson design* yang dilakukan sebagai berikut:

1) Opening "*Kenapa Begitu*"

The activity began with praying followed by apperception and conveying the learning objectives on Theme 3 Sub-theme 3 "Let's Be Inventors". The content of the lesson in Theme 3 Sub-theme 3 in Indonesian with KD. 3.2. Exploring the contents of the scientific explanation

(explanation) text that is heard and read aloud. It contains material on the use of effective sentences and standard and non-standard vocabulary. KD Citizenship Education. 3.2. Analyzing the implementation of obligations, rights, and responsibilities as citizens and their additions in daily life.

Students are invited to explore with initial questions about the definition of explanatory text, usage, effective sentences, and how to find standard vocabulary. The data obtained based on observations, most of the students did not dare to express their opinions to answer, even if they answered in a voice that slowly did not believe in themselves.

Provide some examples of the use of effective sentences and standard words as well as examples of researchers' rights, and obligations as citizens. However, most of the students still asked how it could be like that.

2) Core "*Oh Begitu*"

In the next stage in the core activity, students are invited to make groups start learning with the RADEC model. The syntax of the RADEC model in Sopandi (2017) that has been adapted and used in core activities is shown in the following table:

Table 1.1. RADEC Model Learning Syntax

Stages	Activity	Description
Read	Students are presented with reading materials from various sources of information, in this activity the researcher makes an electronic book with a flip builder. It contains readings and videos related to learning in Theme 3 Sub-theme 3 "*Ayo Menjadi Penemu*". Students are given time to read and analyze the videos in the e-book. Then take notes on things that are important or that you don't understand.	
Answer	The next stage is that students are given direct questions and answers regarding the readings they have read and provided comments regarding the videos they have seen. Then the researcher gave an educational game from worldwall.net with the type of maze chase or a maze game with 5 questions related to reading at the read stage.	
Discuss	Pada tahap diskusi anak sesuai kelompok akan mengerjakan tugas membuat teks eksplanasi pada lembar presentasi kolaboratif dengan menggunakan fasilitas *google slide*. Masing-masing kelompok akan mencari sumber informasi tentang penemuan yang sudah dibagikan kemudian mencari dari berbagai sumber termasuk internet.	

Explain	At the discussion stage, children according to groups will work on the task of making explanatory text on a collaborative presentation sheet using the Google Slides facility. Each group will look for sources of information about the findings that have been shared and then search from various sources including the internet.	
Create	Furthermore, in the last stage, students are invited to practice skills by making papercrafts with designs that have been provided. Then students will write the explanatory text independently using standard vocabulary and effective sentences. Then each group will present their work in front of the class.	

3) Closing "*Jadi Begitu*"

In the evaluation stage, students are given verbal questions about the material that has been taught, as well as reflection on the process of learning activities and asking about the learning experiences gained. Furthermore, students are asked to continue with structured tasks in the form of explanatory texts about inventors in the world by searching for internet sources, then students write their own in their language using standard vocabulary and effective sentences.

b. The 21st Century Learning Skills in Lesson Design Model RADEC

Zubaidah (2018) In his research, he identified the competencies needed in the 21st century, including critical thinking, creative thinking skills, communication skills, and collaboration skills or better known as the 4Cs. These skills are expected to be achieved through learning activities using the RADEC model lesson design. 21st Century skills will be described in this activity according to the syntax of the Read, Answer, Discuss, Explain, Create (RADEC) learning model. The purpose of this study is the achievement in training 4C in the RADEC learning model.

The following is a descriptive analysis of the learning process activities using the RADEC model lesson design:

1) Critical Tinking

In critical thinking skills, students can think to make effective reasons, solve problems, calculate possibilities, make conclusions, and make decisions (Zubaidah, 2018). This skill is shown at the read stage. Students are presented with an electronic book with an explanatory text of Indonesian lessons about inventors who changed the world, then videos about inventors who changed the world are also presented. In the Civics lesson content, students are presented with videos of the function of traffic signs, and readings related to rights, obligations, and responsibilities as citizens are presented. At this stage, students will analyze the learning video and record important things and new things that are obtained from the video. In the reading text provided, students will record important information, new vocabulary obtained, and then conclude.

At the answer stage, students are presented with direct questions and educational games with questions that contain the content of Indonesian and Civics lessons, to train their analytical skills and evaluate the facts learned. Furthermore, at the discussion stage, the skills of honing both inductive and deductive reasoning will be honed, students are invited to draw conclusions based on the analysis of the explanatory texts learned and then poured on collaborative worksheets in each group.

This is in line with the research by Setiyawati et al., (2017) that critical thinking skills include: 1) inductive or deductive reasoning; 2) analyze the interrelationships of each part of the whole to produce a complex system; 3) analyze and evaluate the facts; 4) draw conclusions based on the results of the analysis; 5) solve unusual problems in conventional or creative ways.

2) Creativity

Trilling & Fadel (2009) in his book mentions that 21st-century skills require creativity and innovation such as the creation of new ideas such as brainstorming, elaborating, perfecting, and analyzing ideas to increase creative efforts, being open and responsive to new and diverse points of view. This skill is seen when students are discussing how to find resources to fulfill group assignments. Students divide assignments and receive various sources obtained through internet searches, to be used as reports in the explanatory text that is being worked on.

In the creation stage, students are trained to make structured tasks in compiling explanatory texts in their language and using effective sentences and standard vocabulary. In addition, students are given a stimulus to make paper crafts that have been prepared or make their three-dimensional works so that they can practice their skills and creativity.

3) Communication

According to Binkley et al. (2014) communication needed in the 21st century is more open with a variety of information and a high level of analysis that encourages openness in the group or environment. In the discussion, stage students are trained to solve problems, receive a variety of information, compile and present the results of their group work. This stage trains students to convey message ideas in a complete, clear, and firm manner. Understanding the interlocutor, providing information in the child's language, and convincing the audience to accept the information conveyed.

Communication skills when conveying the idea of a complete message, spoken, firmly, fully understands the interlocutor, delivered in a language according to the recipient of the information, ensures that the information conveyed can be accepted by the other person (Zubaidah, 2018)

4) Collaboration

Collaboration is a skill that develops collective intelligence, helps, suggests, accepts, and negotiates through interactions with others mediated by technology (Brown, 2015). This skill is seen in the discussion and creates stages, students will be trained to collaborate in one group with their respective division of tasks. Some are tasked with finding sources about the invention of planes, trains, ships, and cars. Then compiled into a scientific text that will be presented. Some compose papercrafts by cutting, folding, and combining them into three-dimensional works.

The purpose of the collaboration is to give the people involved the opportunity to work together to generate ideas and at the same time get feedback on those ideas. Good collaboration will be built from a group of independent people who realize that they cannot live without synergizing. Thus, it can be interpreted that collaboration can occur when two or more people work together to achieve a common goal.(Zubaidah, 2018)

OBSERVATION RESULTS

Observations by observers show that the RADEC learning model attracts students' attention in teaching and learning activities. This can be seen from active participation in every syntax that is passed. The contents of the competencies delivered such as reading materials and videos are following the 2013 syllabus and curriculum. The RADEC learning syntax is systematic and very clear, making it easier for students to go through the learning process carried out and easily carried out by other teachers. In learning using the RADEC model, students train critical skills by playing educational games, video analysis, and discussion activities.

Students' creativity can be seen when discussing and compiling paper crafts and explanatory texts. Communication skills are shown in discussion activities followed by the presentation of work in front of the class. Cooperation and collaboration are shown when students compose paper crafts and look for reference sources for presentation needs. Students are responsible for and respond to their respective assignments.

The advantages of the RADEC learning model with the media provided by researchers make children more interested because it is more fun. The presentation of electronic books with a more attractive design is equipped with a video in it. There are educational games that provide a stimulus for children's critical thinking, there are collaborative presentation sheets, interactive worksheets that make students feel challenged to solve the questions given. Students are provided with paper crafts to make three-dimensional designs easily. The use of the RADEC learning model allows teachers to gain all competencies in cognitive learning and soft skills.

The weakness of the learning model that is delivered in less time duration because of the many stages that must be passed. The use of technology-based media with internet network limitations and student gadget specifications.

CONCLUSIONS AND SUGGESTIONS

The conclusions of this study are 1) lesson design trains teachers to prepare the learning process; 2) The RADEC model has a systematic, clear, and easy syntax; 3) Lesson designing using the RADEC learning model can train 21st-century skills in elementary school students; 4) Soft skills (1). Critical Thinking and Problem-Solving; (2) Creativity and Innovation; (3) Communications; (4) Collaboration 4C is found in the learning process with the RADEC learning model.

Learning with the RADEC model can be applied to any learning content because it has a systematic, clear, and easy syntax.

ACKNOWLEDGEMENTS

REFERENCES

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2014). Assessment and Teaching of 21st Century Skills. In P. Griffin, B. McGaw, & E. Care (Eds.), *Assessment and teaching of 21st century skills*. Springer. https://doi.org/10.1007/978-94-007-2324-5_2

Brown, B. (2015). Twenty First Century Skills : A Bermuda College Perspective. *Journal of Bermuda Collage*, *1*(June), 58–64. https://www.college.bm/images/documents/bcj/Vol_1/Twenty_First_Century_Skills–A_Bermuda_College_Perspective.pdf

Handayani, H., Sopandi, W., Syaodih, E., Suhendra, I., & Hermita, N. (2019). RADEC: An Alternative Learning of Higher Order Thinking Skills (HOTs) Students of Elementary School on Water Cycle. *Journal of Physics: Conference Series*, *1351*(1). https://doi.org/10.1088/1742-6596/1351/1/012074

Kim, H., Sefcik, J. S., & Bradway, C. (2017). Characteristics of Qualitative Descriptive Studies: A Systematic Review. *Research in Nursing and Health*, *40*(1), 23–42. https://doi.org/10.1002/nur.21768

Munawaroh, H., Sudiyanto, & Riyadi. (2018). Teachers' Perceptions of Innovative Learning Model toward Critical Thinking Ability. *International Journal of Educational Methodology*, *4*(3), 153–160. https://doi.org/10.12973/ijem.4.3.153

Samad, S., & Suardi. (2020). Pengembangan Soft Skill Peserta Didik. *Seminar Nasional Hasil Pengabdian Kepada Masyarakat*.

Setiyawati, E., Sunardi, & Kurniati, D. (2017). Pengembangan Indikator4 C's Yang Selaras Dengan Kurikulum 2013 Pada Mata Pelajaran Matematika SMP/MTs Kelas VIII Semester 2. *Kadikma*, *8*(3), 134–144.

Sopandi, W. (2017). The quality improvement of learning processes and achievements through the read-answer-discuss-explain-and create learning model implementation. *Proceeding 8th Pedagogy International Seminar 2017: Enhancement of Pedagogy in Cultural Diversity Toward Excellence in Education*, *8*(229), 132–139.

Sunismi, Fathani, A. H., & Baidawi, M. (2020). Profile of Learning and Innovation Skills (4C's) of Prospective Teachers. *Proceedings of the International Conference on Community Development (ICCD 2020)*, *477*(Iccd), 687–692.

Suryanti. (2017). Pendidikan dasar: antara harapan dan kenyataan. *Prosiding Seminar Nasional Dan Call for Papers Pendidikan*, 1–12.

Susanti, E., & Arista, A. (2019). Analisa Tingkat Pengetahuan Guru terhadap Kompetensi 4C. *Prosiding Seminar Nasional Ilmu Sosial Dan Teknologi (SNISTEK)*, *September*, 73–78. http://ejournal.upbatam.ac.id/index.php/prosiding/article/view/1509

Trilling, B., & Fadel, C. (2009). Bernie Trilling, Charles Fadel-21st Century Skills_ Learning for Life in Our Times -Jossey-Bass (2009). *Journal of Sustainable Development Education and Research*, *2*(1), 243.

Winaryati, E., & Alfiah, A. (2019). Analysis 4 Cs Pada Pembelajaran Lingkungan dengan Metode Journey Melalui Lesson Study di TK ABA 01 Mranggen Demak. *Edusainstek, Seminar Nasional Solving, Problem*, 11–23.

Zubaidah, S. (2018). Mengenal 4C: Learning and Innovation Skills Untuk Menghadapi Era Revolusi Industri 4.0. *2nd Science Education National Conference*, *September*, 1–7.