

**THE EFFECTIVENESS OF THE READ, ANSWER, DISCUSS,  
EXPLAIN, AND CREATE (RADEC) LEARNING MODEL ASSISTED  
BY FLASHCARD MEDIA IN IMPROVING STUDENTS'  
UNDERSTANDING OF SCIENCE CONCEPTS IN ELEMENTARY  
SCHOOL**

**Asep Samsudin, Anugrah Ramadhan Firdaus**

Institut Keguruan dan Ilmu Pendidikan Siliwangi  
*anugrah@ikipsiliwangi.ac.id*

**ABSTRAK**

Penelitian ini bertujuan untuk melihat efektifitas dari penerapan model pembelajaran RADEC terhadap pemahaman siswa materi energi alternatif di sekolah dasar. Penelitian ini dilakukan di salah satu Madrasah Ibtidaiyah di Kabupaten Bandung dengan sampel kelas IV sebanyak 38 siswa. Penelitian ini menggunakan metode pre-eksperimen dengan desain One Group Pretest-Posttes. Instrumen yang digunakan merupakan soal uraian tentang materi energi sebanyak 14 soal yang mencangkup indikator pemahaman konsep. Hasil penelitian menunjukkan bahwa rata-rata skor pretest siswa sebesar 7,3 dan rata-rata skor posttest siswa adalah 8,65 hal ini menghasilkan nilai gain sebesar 0,5. Berdasarkan hasil di atas, model pembelajaran RADEC berbantuan flashcard dapat meningkatkan pemahaman siswa

**Keywords:** RADEC, flashcard, understanding

## **A. INTRODUCTION**

Natural science is a compulsory subject in elementary school. This lesson is basically a lesson that studies natural phenomena that are often passed by students at school and in the environment outside of school. Despite its proximity to students, this science lesson is often considered a difficult lesson to learn (Millar, 1991; Umami, 2022). Science learning in elementary school should provide opportunities to foster students' curiosity scientifically (Nehru & Irianti, 2020). This will help them develop the ability to ask questions and seek answers to natural phenomena. The focus of science education in primary schools should be on fostering learners' understanding, interest, and appreciation of the world in which they live. Based on an analysis based on real evidence based on one's own experience when conducting observations, it turns out that it is difficult for teachers to apply the material so that students' understanding of the material presented is low.

To overcome the above problems, a learning model is needed that can help students to understand the lesson better because the presence of creative and innovative teachers will make science material, which is mostly categorized as difficult, easier to understand (Nehru & Irianti, 2020). Learning will be more active and involve students during the process. In addition, the difficulty of understanding science is due to the lack of reading sources that attract students to be able to continue to wonder about natural events that occur. It is this habit that affects a person's understanding of the material being taught (Firdaus & Rahayu, 2020).

The presence of the covid-19 pandemic makes the learning process more difficult. The endless Covid-19 pandemic can hamper economic, social, and educational activities (Wang et al., 2020). The existence of this pandemic has made various sectors to adjust. In the education sector, there has been a change in the learning process. With strict social distancing policies, most educational institutions including schools are closed and forced to carry out the learning process online (Kaup et al., 2017).

Online learning makes students must be more independent in learning. Teaching media assistance is needed that can facilitate students to be able to reload the material taught. The RADEC model is one of the models that adopts a flipped classroom learning approach where learning is mostly done outside the classroom and when face-to-face only discusses the results of independent learning. Coupled with the help of flashcard media developed, students can get reading material easily for reading material at the beginning of the RADEC model stage.

## **B. LITERATURE REVIEW**

Concept understanding is an important factor in activities. Concept understanding can be interpreted as a person's thinking process to process the learning material received so that it becomes meaningful (Aunurrahman, 2012). Factors that influence the learning process to achieve concept understanding are internal factors which include student character, attitude towards learning, learning motivation, learning concentration, processing learning materials, exploring learning outcomes, self-confidence, and learning habits. External factors consist of schools, teachers, friends, and learning models used by teachers (Fatimah, 2017).

The development of learning models that are mostly sourced from the western world, this often causes incompatibility with the conditions that exist in Indonesia. Therefore, there is a need for a learning model that is suitable for education in Indonesia (Pratama et al., 2019). RADEC learning model is an alternative learning model that is in accordance with Indonesian conditions (Sopandi, 2017). This learning model chooses 5 stages consisting of Read, Answer, Discuss, Explain and Create. This model is a model developed against the background of education in Indonesia where this model starts with the Read stage where this stage is a stage that is rarely done in Indonesia.

Media is a means to an end. One of the media that can create an effective learning process is Flash card media. According to Satriana (2013) in his article entitled improving the ability of

number symbols through flashcard media, states that Flash cards are learning media in the form of picture cards measuring 25x30cm. the images on the flashcards are a series of messages presented with a description of each image listed on the back. Another opinion expressed by Surana in (Wardani et al., 2013), that flashcards are a form of educational game in the form of card plates containing images and words deliberately designed by Doman to improve several aspects, including: developing memory, training independence and increasing vocabulary. Based on some of the definitions of Flash cards above, it can be defined that Flash cards are visual media (2 dimensions) in the form of cards that contain images related to the subject matter so that they can channel messages from the message source to the message recipient.

### C. METHOD

This research employed a pre-experimental method through one group pretest post-test design (Gall et al., 2010). The pre-experimental method is selected since the intervention was only conducted to one group, without the presence of a control group as a comparison (Creswell, 2012). The initial stage of the research was the provision of pretest and treatment, while post-test was given in the later stage. The following table illustrates the one-group pretest-posttest design in this research.

Table 1. Research Design

Group	O <sub>1</sub>	X	O <sub>2</sub>
-------	----------------	---	----------------

This study was conducted in one of the Madrasah Ibtidaiyah schools in Bandung Regency, West Java in the 2022/2023 school year. In this study, the sample was obtained by nonprobability sampling with purposive sampling technique (Gall et al., 2010)The sample of this study amounted to 36 fourth grade elementary school students. The instrument used was a multiple choice test question that contained indicators of concept understanding adapted from Anderson and Krathwohl (2010) in the form of: (1) Interpreting; (2) Exemplifying; (3) Classifying; (4) Summarizing; (5) Concluding; (6) Comparing and (7) Explaining. Instrument validation was carried out through construct validity based on judgments from experts, peers, and teachers as practitioners.

Quantitative descriptive method, with SPSS and Microsoft Excel tools, was used to analyze the data collected from the questionnaire. In revealing the effectiveness of NOS explicit learning design implementation, the pretest and post-test results were processed with SPSS.

### D. RESULT AND DISCUSSION

Based on the results of the research conducted, the score of understanding of the concept of ipa on energy material using the RADEC learning model assisted by flashcard media can be seen in the figure below

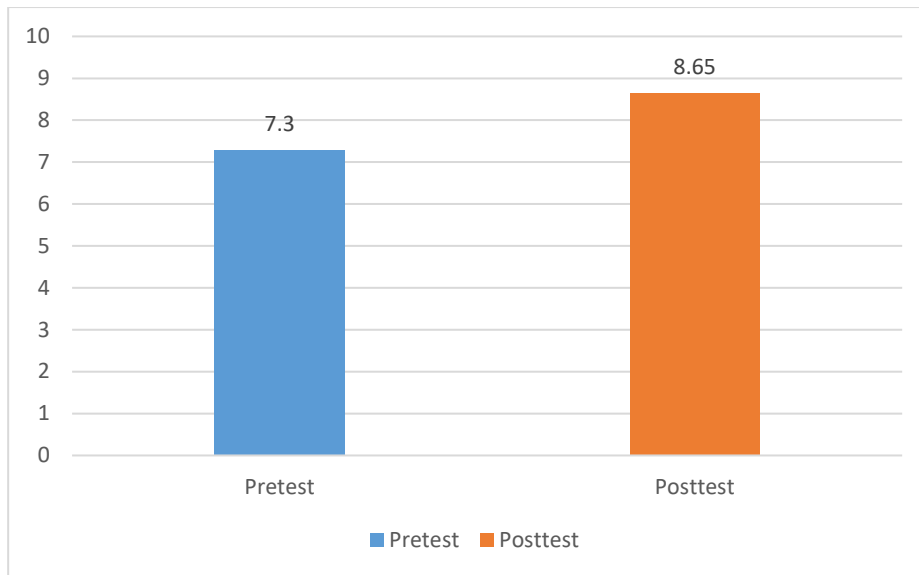


Figure 1. Concept understanding gain

Based on the data above, there was an increase during the learning process using the RADEC learning model assisted by flashcard media. The average score of student understanding at the time of the pretest obtained a score of 7.3 and increased during the posttest to 8.65. With this increase, the gain was calculated based on the pretest and posttest scores and the resulting gain value was 0.5. According to (Hake, 1999), it is explained that with the resulting gain score, learning has a moderate learning effectiveness value. In general, learning during a pandemic is a new experience. Preliminary observations showed a lack of student activity during online learning. With the application of the RADEC learning method, it does show an increase in student activity during learning. This is believed to be due to the flipped classroom system applied to this RADEC learning. The first stage of RADEC learning is the READ stage. In this stage students are given flashcard media where the media is equipped with a QR Code that links to the reading they will read.



Figure 2. Alternative Energy Flashcards

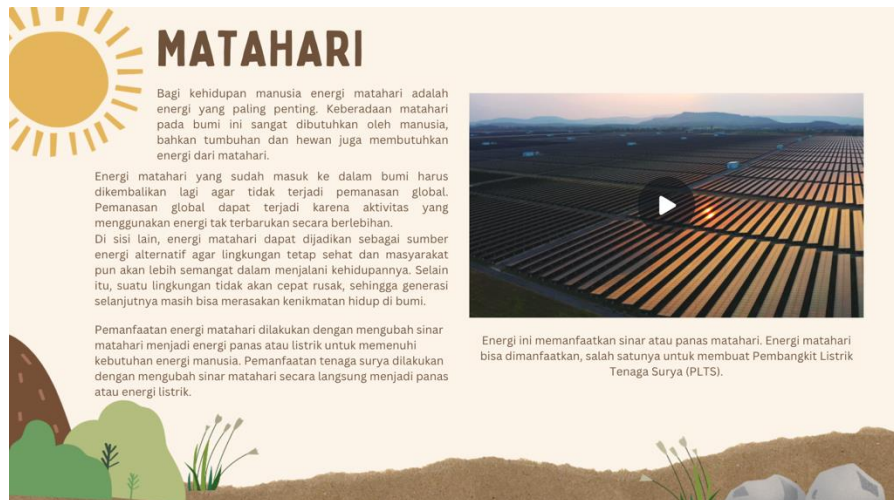


Figure 3. QR Code scan result reading text

It is important to realize that reading is an activity that is rarely done. Although a lot of literature mentions the importance of reading, it turns out that this process is still difficult for children. One of the causes is the lack of interesting children's reading available in the environment (Akubulio et al., 2015). With this flashcard media, students become motivated to read because of the attractive card design and can be carried anywhere.

### E. CONCLUSION

Based on the results of the study, the implementation of the raden learning model assisted by flashcard media can have an effect on increasing student understanding seen from the results of the pretest and post-test scores obtained.

### F. ACKNOWLEDGEMENT

Thank you to Institut Keguruan dan Ilmu Pendidikan Siliwangi for all the support provided during this research process.

### REFERENCES

- Akubulio, F., Okorie, E. U., Onwuka, G., & Uloh-Bethels, A. C. (2015). Reading Readiness Deficiency in Children: Causes and Ways of Improvement. *Journal of Education and Practice*, 6(24), 38–43.
- Aunurrahman. (2012). *Belajar dan Pembelajaran*. Alfabeta.
- Creswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. In *Educational Research* (4 ed., Vol. 4). Pearson. <https://drive.google.com/file/d/1d5ZzlgJuCrwAyLpdBeK5dhKMZTpE2HNb/view>
- Fatimah, S. (2017). Analisis Pemahaman Konsep Ipa Berdasarkan Motivasi Belajar, Keterampilan Proses Sains, Kemampuan Multirepresentasi, Jenis Kelamin, Dan Latar Belakang Sekolah Mahasiswa Calon Guru Sd. *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, 1(1), 57–70. <https://doi.org/10.24036/jippsd.v1i1.7934>
- Firdaus, A. R., & Rahayu, G. D. S. (2020). Engineering design behavior elementary student's through the STEM approach. *Journal of Physics: Conference Series*, 1511, 012089. <https://doi.org/10.1088/1742-6596/1511/1/012089>
- Gall, M. D., Gall, J. P., & Borg, W. R. (2010). Educational research: An introduction. In *Qualitative Voices in Educational Research*. Pearson Education. <https://doi.org/10.4324/9781003008064-1>
- Hake, R. (1999). *Analyzing change/gain score*. <https://doi.org/10.24036/ekj.v1.i1.a10>
- Kaup, S., Jain, R., Shivalli, S., Pandey, S., & Kaup, S. (2017). Sustaining academics during COVID-19 pandemic: The role of online. *Indian Journal of Ophthalmology*, 68(6),

1220. <https://doi.org/10.4103/ijo.IJO>
- Millar, R. (1991). Why is science hard to learn? *Journal of Computer Assisted Learning*, 7(2), 66–74. <https://doi.org/10.1111/j.1365-2729.1991.tb00229.x>
- Nehru, N., & Irianti, E. (2020). Analisis hubungan rasa ingin tahu dengan hasil belajar IPA. *Jurnal Pembangunan Pendidikan: Fondasi dan Aplikasi*, 7(1), 53–59. <https://doi.org/10.21831/jppfa.v7i1.25234>
- Pratama, Y. A., Sopandi, W., & Hidayah, Y. (2019). RADEC Learning Model (Read-Answer-Discuss-Explain And Create): The Importance of Building Critical Thinking Skills In Indonesian Context. *International Journal for Educational and Vocational Studies*, 1(2), 109–115. <https://doi.org/10.29103/ijevs.v1i2.1379>
- Satriana, A. (2013). Meningkatkan Kemampuan Mengenal Konsep Bilangan 1 Sampai 5 Bagi Anak Tunagrahita Sedang Melalui Media Flash Card Bagi Siswa Tunagrahita Sedang. *Jurnal Ilmiah Pendidikan Khusus*, 2(September), 153–165.
- 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.
- Umami, R. (2022). Difficulties In Understanding The Science Learning Material as Related to Educational Psychology. *Psikologia : Jurnal Psikologi*, 6(1), 13–22. <https://doi.org/10.21070/psikologia.v6i1.1119>
- Wang, C., Horby, P. W., Hayden, F. G., & Gao, G. F. (2020). A novel coronavirus outbreak of global health concern. *The Lancet*, 395(10223), 470–473. [https://doi.org/10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9)
- Wardani, K. Y. T., Koyan, I. W., & ... (2013). Penerapan Metode Bilingual Berbantuan Media Flashcard untuk Meningkatkan Kemampuan Berbahasa Inggris Anak Kelompok B2 di TK Saiwa Dharma Singaraja. *Jurnal Pendidikan Anak ....* <https://ejournal.undiksha.ac.id/index.php/JJPAUD/article/view/1564>