Improving the learning outcomes of physical education students through the application of the read, answer, discuss, and create (RADEC) learning model

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ABSTRACT

Learning outcomes are a necessity that needs to be achieved optimally in every lesson. However, not all students can realize their desire to obtain optimal learning outcomes. Therefore, through writing this article it aims to analyze the increase in student learning outcomes in physical education philosophy lectures through the application of the RADEC learning model. The chosen research method is classroom action research. As many as 30 students were involved in this study as research subjects. Data was collected using techniques and instruments in the form of observation, written tests, and interviews. Data were analyzed quantitatively and qualitatively. The results of the study revealed that student learning outcomes in cycle 1 had an average value of 67.53; and classical completeness of 60%. The results of the study in cycle 2 increased the mean score to 73.73 and classical completeness to 96.67%. From the results of the study, it was concluded that the application of the RADEC learning model was proven to be able to improve physical education student learning outcomes in physical education philosophy lectures. It is recommended that lecturers implement this learning model in different subjects.

Keywords: radec, learning outcomes, physical education

INTRODUCTION

The physical education philosophy course is a learning tool to provide learning experiences by thinking logically. However, it is very concerning that most students consider physical education philosophy courses to be boring and less interesting to study (Nopiyanto & Raibowo, 2020). This is evidenced by the results of observations that have been made that 70% of students who take physical education philosophy lessons are less interested. This is reflected in arriving not on time, occupying a sitting position at the back, students playing online games, or opening social media in class, students are sleepy listening to lectures from lecturers in charge of the course. In addition to the lack of interest, in the physical education philosophy class, it was also found that students had low learning motivation. This is reflected in the fact that students easily give up finding answers to basic questions about learning materials.

The interest that exists in students to attend lectures will have an impact on learning outcomes (Lena et al., 2022). From the results of tests conducted by lecturers supporting the subject, it was concluded that 75% of students who did the Physical Education Philosophy

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course contract did not understand the concept. Understanding the concept is very important because it will make it easier for students in solving various problems they face (Kurniawati & Nita, 2018). In addition, problems regarding student learning outcomes in physical education philosophy learning also need to be improved because there are still 80% of students who get learning outcomes less than B. Factors within students and outside students also contribute to achieving optimal learning outcomes. Internal factors such as learning readiness, interest, learning motivation, and student psychology (Kadosh & Staunton, 2019; Magdalena, 2015) Meanwhile, from outside, such as the application of learning models used by lecturers (Lin et al., 2016). There is still a lack of previous research that applies the RADEC method to the field of sports, especially physical education. This is because physical education learning is generally applied dominantly to practice, so that theoretical understanding that should be read and discussed is minimally applied in the learning process. Thus, students have the ability to demonstrate a movement, but it is difficult to give a scientific explanation. Based on this, researchers are interested in applying the RADEC method to students in physical education learning.

Students revealed that dissatisfaction with learning outcomes in philosophy courses was due to boring learning activities so the level of saturation increased. Boredom in the learning process is because students have to pay attention to the lecturer's explanations which are too long (Hidayat et al., 2020; Zulfikar et al., 2019). The application of conventional learning models carried out by lecturers will hinder the level of student participation in learning activities such as reading, answering, and collaborating in discussion activities (Evita et al., 2019). The learning process should create a harmonious learning atmosphere, active participation between students, and bring up student ideas to overcome problems in learning (Balasubramaniam et al., 2018).

To build an ideal learning atmosphere, lecturers need to implement learning models that can meet the needs of students in class (Zurweni et al., 2017). Lecturers can implement the Read, Answer, Discuss, and Create (RADEC) learning model in physical education philosophy courses. Through this learning model, students will be guided to read, answer, discuss, and be creative about learning materials so that each student is actively involved in learning (Sopandi & Handayani, 2019). The results of previous research stated that the RADEC learning model was able to improve learning outcomes (Sopandi, 2017; Sukmawati et al., 2020). The researcher chose to apply RADEC learning to physical education students because it considers several advantages of the RADEC method, among others: always encouraging students to be actively involved in the learning process by reading the material before class starts,

encouraging students to learn independently, connecting what students know with the material being studied, connecting the material being studied with real life or issues in physical education and the field of sports in general, providing opportunities for students to actively ask questions, discuss, propose an investigation plan, and conclude the material being studied, and providing opportunities for students to learn the material in depth through pre-learning assignments.

Based on the positive impact arising from the implementation of the RADEC learning model, it encourages initiatives from researchers to implement it in physical education philosophy lectures in the physical education study program at the University of Bengkulu. The aim is to analyze the increase in student learning outcomes after attending physical education philosophy lectures using the RADEC learning method. For students, this research is useful to meet the needs of collaborative and innovative learning. In addition, the improvement in the quality of learning resulting from the implementation of this learning model provides a positive image for the physical education study program.

METHODS

The purpose of the research will be achieved if the research is supported by the selection of the right method. The method used is classroom action research or PTK. Essentially CAR is aimed at improving the quality of learning (Susilo et al., 2022). A total of 2 cycles were used to implement the entire series of this research. Physical education philosophy class at Bengkulu University's physical education study program was chosen as the research location. The research was carried out from April to June 2023. A total of 30 students were used as research subjects.

The research procedure was carried out in accordance with the character of PTK which was divided into several stages. The first is the planning stage which contains the preparation of research material, carrying out the learning design into the learning plan, and the facilities or media needed for the smooth running of the research. The second is the implementation or action which contains the application of the RADEC learning model following the design that has been formulated in the lesson plan. The third is an observation that contains observations of all student academic activities during the implementation of RADEC learning. The fourth is a reflection which contains an analysis of the strengths and obstacles that occur during the learning process.

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Techniques and Instruments

Research data was collected using a combination of several techniques and instruments, namely: observation, written tests, and semi-structured interviews. The research instrument is shown in the table.

Table 1. The Observation Guide

No	Indicator	Description
1	Read	Students read the learning material carefully.
2	Answer	Students can answer questions during the learning process.
3	Discussion	Students take part in discussions actively.
4	Explain	Students can explain the material well
5	Create	Students can generate ideas from a problem that is being studied in learning.

Table 2. The Written Test Grid

No	Indicator	Number of Question
1	The importance of studying philosophy	1
2	Philosophy type	2
3	philosophy function	3
4	Philosophy stream	4
5	Modern and traditional philosophy	5

Table 3. Interview Guidelines

No	Question	Yes	No	Information
1	Do you experience obstacles when studying physical education philosophy?			
2	Does the RADEC learning process lead you to be active in learning?			
3	Has the RADEC method had a positive impact on you taking physical education philosophy classes?			

Data Analysis

Research data from observations and interviews were analyzed qualitatively by giving the meaning of each statement expressed by the research subject. While the learning outcomes data were analyzed quantitatively by looking for the average value and classical completeness.

RESULTS AND DISCUSSION

The results of data analysis from the application of the RADEC learning model in

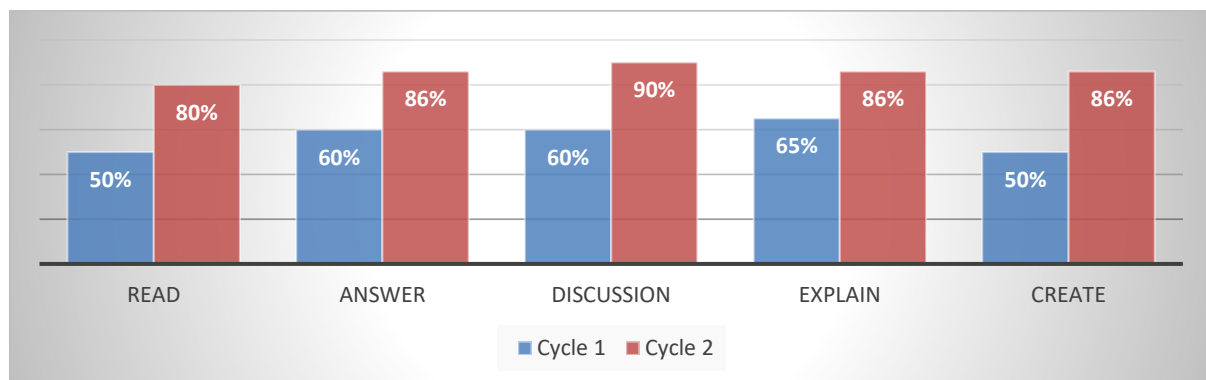physical education philosophy lectures are presented in figures and tables.

Results

Figure 1. Observation Results of Student Learning Activities

Based on the observation results as outlined in Figure 1, it can be concluded that there is an increase in student learning activity seen from each stage of the RADEC learning model.

Table 4. The Results of Learning Outcomes

No	Learning Outcomes	Mean	Standard Deviation	Classical Completeness
1	Cycle 1	67.53	13.68	60%
2	Cycle 2	73.73	14.47	96.67 %

The application of the RADEC learning model has a positive impact on student outcomes in participating in physical education philosophy courses. It can be seen in Table 1 that from student learning outcomes there is an increase in both the average value and classical completeness.

Table 5. The Result of the Interview

No	Questions	Cycle 1		Cycle 2	
		Yes	No	Yes	No
1	Do you experience obstacles when studying physical education philosophy?	50%	50%	10%	90%
2	Does the RADEC learning process lead you to be active in learning?	60%	40%	90%	10%
3	Has the RADEC method had a positive impact on you taking physical education philosophy classes?	70%	30%	90%	10%

Table 5 summarizes the results of the analysis of the responses given by students after participating in learning in each cycle. In general, it can be concluded that students give a positive response to learning using the RADEC model.

Discussion

The application of RADEC learning in cycle 1 has not been able to have a significant impact on student learning outcomes in physical education philosophy lectures. The results of this study are in line with previous research which revealed that learning outcomes are something that is obtained not in an instant way (Logan et al., 2021). Various factors contribute to student learning outcomes such as learning readiness, psychology, learning environment, learning resources, and learning styles (Kadosh & Staunton, 2019; Magdalena, 2015; Lin et al., 2016). Learning outcomes that are not optimal in cycle 1 encourage researchers to reflect.

Guided by the results of the reflections carried out in cycle 1, it was concluded that the main cause of not optimal learning outcomes was due to a lack of readiness to learn student. Student learning readiness can be seen from the results of observations on each applied syntax. In the first syntax, namely read, it is known that only 50% of students read the material. This means that there are still many students who have not mastered the material presented. Reading is the first step for individuals to understand content or learning materials (Damaianti et al., 2020) Reading activities must be included in every learning process to produce meaningful and effective learning (Cheung & Slavin, 2013). If individuals do not have an interest in reading learning material, there will be great potential for less-than-optimal learning outcomes achieved (Senen et al., 2021). Because only 50% of students have reading interests, it has an impact on the way syntax 2 in this study is answered. Students can answer basic questions about the material if they have previously read the material (Sulman et al., 2020). At this stage, the lecturer asks basic questions about the material being read. But, unfortunately, only 60% of students can answer it. A series of questions and answers are part of the learning process. Through question and answer, the lecturer has the opportunity to find out the level of student understanding of the learning material. The better the student's understanding of the learning material, the more positively correlated with the learning outcomes.

In the next stage, namely the discussion, it is known that as many as 60% of students have followed the course of the discussion enthusiastically. Meanwhile, 40% of other students did not participate in the discussion enthusiastically because they did not understand the material well. Students who can follow the course of the discussion are students who understand the learning material. Students who actively participate in discussions will ask questions and learn to use various alternative solutions to problems.

At the explained stage it is known that in cycle 1 there are 60% of students can explain learning material. The explaining activity is a communication process that aims to convey

important information related to the discussion material. Students who do not have an understanding of the learning material will certainly have difficulty explaining it to their peers during discussions. In the last stage, namely, create or create. From the results of observations in cycle 1, it is known that only 50% of students can do it well. In cycle 1 it is known that students have not been able to provide creative ideas to solve problems encountered in the learning process. Most students still use other people's ideas adopted from the internet. The creation process requires extra time because students are encouraged to maximize their efforts to get creative ideas. Learning outcomes that were not optimal in cycle 1 encouraged researchers to make better efforts in cycle 2. Some of the efforts made by researchers were motivating students, explaining the objectives of learning using the RADEC model, facilitating students in the process of finding learning material and guiding the way of student discussion.

Improvements made to the learning process in cycle 2 had a positive impact on student learning activities. From the observations, it was shown that there was an increase in students' reading activity from 50% to 80%. That is, students have understood the importance of reading material as a first step in physical education philosophy lectures. Students are increasingly enthusiastic about reading lecture material. Reading is an academic activity that needs to be continuously improved and become an academic culture for students. Through reading students will get various important information, enrich the body of knowledge, and provide many alternative solutions to problems in philosophy class (Bureau, 2021). In cycle 2 students are given the freedom to read reading sources not only from text reading materials but with electronic reading sources. This step proved to be effective because students have a variety of learning styles (Ahmed et al., 2013). Some students are more comfortable reading with textbooks and some students tend to be more comfortable using electronic reading sources that can be read via laptop or mobile devices (Tzenios, 2020). The increased reading activity carried out by students also contributed to improving students' ability to answer various questions from the material presented. The results of cycle 2 observations revealed that as many as 86% of students were able to answer questions. Students' ability to answer questions is the result of mastery of the material obtained in reading activities (Muhlisin, 2019; Setiawan et al., 2020).

The discussion process in cycle 2 runs effectively and is directed because students have understood the material. The question-and-answer process during the discussion is following the context of the lecture material. As many as 90% of students were enthusiastic about participating in the discussion in cycle 2. The discussion process guided by the lecturer helped students to keep the discussion going according to the course material. The discussion process in cycle 2 is better because students are more prepared in mastering the material compared to

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cycle 2.

At the explained stage, as many as 86% of students demonstrated their ability to explain lecture material. The explanations given by students are easily understood by colleagues because students use simple language as a result of concluding their understanding from reading sources. At the explain stage it trains students to communicate effectively so that the material presented can be understood by class members.

In the final stage, namely create, it is known that in cycle 2 as many as 86% of students were able to create original innovative ideas. This is different from cycle 1 where most of the students used other people's ideas from internet sources. This increase can occur because students have followed the entire RADEC learning series at the read, answer, discussion, and explain stages. In cycle 2 student learning barriers tend to decrease. This is evidenced by student statements during interviews. From the results of the interviews, it was concluded that as many as 90% of students answered that they did not experience learning barriers in cycle 2. This could happen because students were able to follow the learning stages well. The adaptation process must be passed by students due to changes in learning models from conventional to innovative learning models (Klašnja-Milićević et al., 2017).

The application of the RADEC learning model in Physical Education philosophy lectures helps students to be active in learning such as reading, answering, explaining, discussing, and creating solutions to the problems they face in learning. From the results of the interviews, it was concluded that most of the students were more active in learning in cycle 2. This was evidenced from the results of the interviews in which in percentage terms it was known that in cycle 1 it was 60% and in cycle 2 90% of students declared themselves active in participating in learning. The positive impact was also felt by students in the RADEC learning process. Students who are used to taking physical education philosophy courses using conventional methods switch to the RADEC model. Students feel challenged to be able to answer, explain material, have active discussions, and create innovative ideas. From the results of the interview

It was concluded that students agreed that the RADEC learning model had a positive impact. The most dominant positive impact felt by students is increasing their ability to analyze learning material, answer questions in the discussion process, and explain lecture material. So that this ability contributes to student learning outcomes.

CONCLUSION

The philosophy of physical education course presented through the RADEC learning model makes a significant contribution to student learning outcomes. From the results of the study it can be concluded that there was an increase in student learning outcomes from an average score of 67.53 to 73.73 and classically from 60% to 96.67%. The researcher hopes that the application of the RADEC method can be applied to all sports and other learning subjects, so that students in addition to being able to practice can also explain in scientific theory.

REFERENCES

Ahmed, J., Shah, K., & Shenoy, N. (2013). How different are students and their learning styles. *International Journal of Research in Medical Sciences*, *1*(3), 212-215. DOI: 10.5455/2320-6012.ijrms20130808

Balasubramaniam, S. M., Bhargava, S., Agrawal, N., Asif, R., Chawngthu, L., Sinha, P., ... & Sood, B. (2018). Blending virtual with conventional learning to improve student midwifery skills in India. *Nurse education in practice*, *28*, 163-167. https://doi.org/10.1016/j.nepr.2017.10.028

Cheung, A. C., & Slavin, R. E. (2013). Effects of educational technology applications on reading outcomes for struggling readers: A best-evidence synthesis. *Reading Research Quarterly*, *48*(3), 277-299. https://doi.org/10.1002/rrq.50

Damaianti, V. S., Abidin, Y., & Rahma, R. (2020). Higher order thinking skills-based reading literacy assessment instrument: An Indonesian context. *Indonesian Journal of Applied Linguistics*, *10*(2), 513-525. https://doi.org/10.17509/ijal.v10i2.28600

Evita, E., Syahid, A., & Nurdin, N. (2019). Understanding Students' Learning Outcomes Differences Through the Application of the Market Place Activity Type of Cooperative Learning Model and the Application of Conventional Learning Models. *International Journal of Contemporary Islamic Education*, *1*(1), 67-85. https://doi.org/10.24239/ijcied.Vol1.Iss1.5

Hidajat, H. G., Hanurawan, F., Chusniyah, T., & Rahmawati, H. (2020). Why I'm Bored in Learning? Exploration of Students' Academic Motivation. *International Journal of Instruction*, 13(3), 119-136. https://doi.org/10.29333/iji.2020.1339a

Kadosh, K. C., & Staunton, G. (2019). A systematic review of the psychological factors that influence neurofeedback learning outcomes. *Neuroimage*, *185*, 545-555. https://doi.org/10.1016/j.neuroimage.2018.10.021

Klašnja-Milićević, A., Vesin, B., Ivanović, M., Budimac, Z., Jain, L. C., Klašnja-Milićević, A., ... & Jain, L. C. (2017). Personalization and adaptation in e-learning systems. *E-Learning Systems: Intelligent Techniques for Personalization*, 21-25. https://doi.org/10.1007/978-3-319-41163-7_2

Kurniawati, I. D., & Nita, S.-. (2018). Media Pembelajaran Berbasis Multimedia Interaktif Untuk Meningkatkan Pemahaman Konsep Mahasiswa. *DoubleClick: Journal of Computer and Information Technology*, *1*(2), 68. https://doi.org/10.25273/doubleclick.v1i2.1540

Lena, M. S., Trisno, E., & Khairat, F. (2022). The Effect of Motivation and Interest on Students' English Learning Outcomes. *Mextesol Journal*, *46*(3), 1-13.

Lin, J. W., Yen, M. H., Liang, J., Chiu, M. H., & Guo, C. J. (2016). Examining the factors that influence students' science learning processes and their learning outcomes: 30 years of conceptual change research. *Eurasia Journal of Mathematics, Science and Technology*

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Education, *12*(9), 2617-2646. https://doi.org/10.12973/eurasia.2016.000600a

Logan, R. M., Johnson, C. E., & Worsham, J. W. (2021). Development of an e-learning module to facilitate student learning and outcomes. *Teaching and Learning in Nursing*, *16*(2), 139-142. https://doi.org/10.1016/j.teln.2020.10.007

Magdalena, S. M. (2015). The relationship of learning styles, learning behaviour and learning outcomes at the romanian students. *Procedia-Social and Behavioral Sciences*, *180*, 1667-1672. https://doi.org/10.1016/j.sbspro.2015.05.062

Muhlisin, A. (2019). Reading, mind mapping, and sharing (rms): innovation of new learning model on science lecture to improve understanding concepts. *Journal for the Education of Gifted Young Scientists*, *7*(2), 323-340. https://doi.org/10.17478/jegys.570501

Nopiyanto, Y. E., & Raibowo, S. (2020). Penerapan model pembelajaran Jigsaw untuk meningkatkan motivasi dan hasil belajar mahasiswa penjas pada mata kuliah filsafat penjas dan olahraga. *Journal Of Sport Education (JOPE)*, *2*(2), 61-69. http://dx.doi.org/10.31258/jope.2.2.61-69

Senen, A., Sari, Y. P., Herwin, H., Rasimin, R., & Dahalan, S. C. (2021). The Use of Photo Comics Media: Changing Reading Interest and Learning Outcomes in Elementary Social Studies Subjects. *Cypriot Journal of Educational Sciences*, *16*(5), 2300-2312. https://doi.org/10.18844/cjes.v16i5.6337

Setiawan, D., Sopandi, W., & Hartati, T. (2020, March). The influence of read, answer, disscuss, explain, and create (RADEC) learning model on the concept mastery of elementary school students on the water cycle topic. In *Journal of Physics: Conference Series* (Vol. 1521, No. 4, p. 042113). IOP Publishing. 10.1088/1742-6596/1521/4/042113

Sopandi, W. (2017, September). The quality improvement of learning processes and achievements through the read-answer-discuss-explain-and create learning model implementation. In *Proceeding 8th Pedagogy International Seminar* (Vol. 8, pp. 132-139).

Sopandi, W., & Handayani, H. (2019, January). The Impact of Workshop on Implementation of Read-Answer-Discuss-Explain-And-Create (RADEC) Learning Model on Pedagogic Competency of Elementary School Teachers. In *1st International Conference on Innovation in Education (ICoIE 2018)* (pp. 7-11). Atlantis Press.

Sukmawati, D., Sopandi, W., & Sujana, A. (2020, March). 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. In *International Conference on Elementary Education* (Vol. 2, No. 1, pp. 1734-1742).

Sulman, F., Taqwa, M. R. A., Zb, A., Rafzan, R., & Fikri, A. (2020). The Effect of Mathematical Connections on the Mastery of Probability Material. *Edumatika: Jurnal Riset Pendidikan Matematika*, *3*(2), 147-157. https://doi.org/10.32939/ejrpm.v3i2.645

Susilo, H., Chotimah, H., & Sari, Y. D. (2022). *Penelitian tindakan kelas*. Media Nusa Creative (MNC Publishing).

Tzenios, N. (2020). Clustering Students for Personalized Health Education Based on Learning Styles. *Sage Science Review of Educational Technology*, *3*(1), 22-36. Retrieved from https://journals.sagescience.org/index.php/ssret/article/view/22

Zulfikar, T., Dahliana, S., & Sari, R. A. (2019). An Exploration of English Students' Attitude towards English Learning. *English Language Teaching Educational Journal*, *2*(1), 1-12.

Zurweni, Z., Wibawa, B., & Erwin, T. N. (2017, August). Development of collaborative-creative learning model using virtual laboratory media for instrumental analytical chemistry lectures. In *AIP Conference Proceedings* (Vol. 1868, No. 1). AIP Publishing.