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Validity And Effectiveness Of The Radec Learning Model: A Research And Development To Improve Learning Activity Of Junior High School Students

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Abstract

One of the efforts to achieve learning objectives is to design learning models to motivate and active students during the learning process. Read, Answer, Discussion, Explain, and Create (RADEC) is one of the learning models that can stimulate student activity in the classroom. This research is a type of research and development that focuses on testing the validity and effectiveness of the RADEC learning model by involving three experts and 20 grade VIII junior high school students. Data were collected using instruments in validation sheets and test results of learning social science subjects. Furthermore, the data that has been collected is analyzed using a quantitative approach by calculating the average score and comparing it with the categories of validity and effectiveness. The results showed that the RADEC learning model that the researcher had developed proved valid based on the experts' assessment. In addition, the product of this research is also stated to be effective in increasing student activity. Thus, this RADEC learning model can be tested more widely in other schools to get a comprehensive quality picture.

Keywords: Activity, RADEC Learning Model, Validity, Effectiveness.

INTRODUCTION

Advancing education is not an easy job and can be done quickly. Many aspects influence this condition considering that education is a dynamic aspect of life and continues to change with the times (Helaluddin & Alamsyah, 2019). One of the efforts that must be made to advance education is to stimulate and motivate teachers to continue to innovate and always be creative in presenting learning in the classroom (Sawyer, 2005). This must be done so that students remain motivated and passionate in participating in the learning process. Along with the development of cognitive science in learning, there has been a significant interest in finding the best solutions for teaching students (Slavich & Zimbardo, 2012).

Currently, learning methods that still position the teacher as the centre of learning must be changed immediately. The pressure for change strengthened some time ago due to the needs of students, the current working environment conditions, and economic and political changes that are increasingly widespread (Hartikainen et al., 2019). Thus, the position of students as passive learning subjects must be immediately directed to active learning subjects during the learning process in the classroom.

In addition, the shift in learning orientation from teacher-centred learning to

student-centred learning is marked by the demands of the world of work in the 21st century (Krishnan, 2015). Intelligence that is only limited to the ability to memorize and master material concepts is no longer an absolute requirement in entering the world of work. This is confirmed by the many demands from the world of work. It requires individual acts as the main requirement to become a competent person. Currently, the world of work prioritizes individuals capable of communicating, collaborating, thinking creatively, and others (WEF (World Economic Forum), 2019).

Student-centred learning offers a learning process by seeking students to be actively involved in the teaching (Hoidn, 2017). (De-Justo & Delagado, 2015) and (Ito & Kawazoe, 2015) also state that student-centred learning procedures are closely related to much higher achievement, especially job skills and general competency development. In addition, student-centred learning strongly emphasizes the importance of students' roles in learning practices, curriculum, and content (Lee & Hannafin, 2016).

The main objective of the student-centred learning approach is to increase student activity in the classroom. There are still many students who are not active during learning and tend to be passive. Student activity is participatory student participation as a form of response to the teacher (Wijaya et al., 2021). When students are allowed to actively participate in the learning process, they are more responsible for their performance in class (Ligi & Raja, 2016).

One way to stimulate student activity in the classroom through a student-centred learning approach can be done using an appropriate learning model. One of the learning models that can produce students' interest and activity is the RADEC model (Read, Answer, Discuss, Explain, and Create). The RADEC model is a learning model that can encourage students to be active, grow their skills and abilities in collaborating, communicating, and understanding the material well (Andini & Fitria, 2020). In addition, this model can also initiate students to master knowledge through the process of remembering, which is based on constructivism theory (Sukardi et al., 2021).

Several studies have been conducted related to this RADEC learning model. (Pratama et al., 2019) found evidence that the RADEC model improved students' critical thinking skills. In addition, the RADEC model can also be applied in learning tennis with the help of the Learning Media System (LMS) (Rahman et al., 2020). Bahkan, (Kaharuddin, 2020) found several benefits of this model in his research, namely: (1) allowing teachers to design their learning models attractively, (2) improving critical thinking skills, (3) improving analyzing and reading skills, and (4) improve cooperation in groups.

From the several studies that have been carried out, there are still a few researchers who design the RADEC learning model in social studies learning for junior high school students. The ability of teachers to develop learning models is an essential skill that teachers must master. In addition to designing learning models, a teacher must also test the resulting product to see the extent of its quality. The formulation of the problem in this research is how the level of validity and effectiveness of the RADEC learning model for social studies learning increases junior high school students is?

LITERATURE REVIEW

Student Activity

The activeness of students is essential in the learning process to achieve the expected goals. (Sardiman, 2012) states that activity is an activity that is both physical and mental, namely doing and thinking as a series that cannot be separated. Successful learning must go through various kinds of activities, both physical and psychological activities. Student activity is a situation where students actively participate in

following the whole series of learning (Huda & Qohar, 2020).

Everyone who learns must be acting alone, and without any activity, the learning process will not occur. According to (Abdurrahman, 2013), activity is an activity or activity or everything done or activities that occur physically and non-physically. (Fadilurrahman et al., 2019) state that learning requires exercises and concerning the principle of activity suggests that individuals are active learning humans who always want to know. All knowledge must be obtained by self-observation, self-experience, self-investigation by working alone with self-created facilities, both spiritually and technically.

Activity can be said as a component of active learning that involves students doing something and thinking about what they have done (Bonwell & Eison, 1991). In addition, the definition of effectiveness does not mean that students have to move continuously during the learning process (Ni'mah, 2015). In other words, students must be involved at all times during the learning process (Chivata & Oviedo, 2018).

Learning Model

The learning model is a plan or pattern that can be used in implementing the curriculum, designing learning materials, and guiding learning in the classroom or otherwise (Hasbi, 2016). A learning model is a form of education illustrated from beginning to end, explicitly presented by the teacher. In other words, the learning model is a wrapper or frame from applying an approach, method, and learning technique (Komalasari, 2011). In addition, (Sagala, 2005) suggests that the learning model is a conceptual framework that describes a systematic procedure in organizing students' learning experiences to achieve specific learning goals.

According to (Suprijono, 2010), the learning model refers to the approach used, including the learning objectives and the stages in learning activities. The learning model is a plan or pattern used to complete the implementation of the curriculum (lesson plan), design learning materials, and guide learning in the classroom or otherwise (Angelina, 2018). The learning model can be used as a pattern of choice, meaning that teachers may choose an appropriate and efficient learning model to achieve their educational goals.

In addition, the learning model can be associated as a strategy based on theories (or results from research) from educators, psychologists, philosophers, and others that describe how a process is designed for learning (Ellis, 1979). Ellis also mentioned that each learning model contains: (1) rationale, (2) a series of steps used by lecturers and students, (3) a description of the appropriate support system, and (4) methods of evaluating student progress.

In a learning model, there are several elements contained in it. According to (Joyce et al., 2011), there are five components in a learning mode, namely: (1) syntax, namely the operational steps of learning, (2) social system, is the atmosphere and norms that apply in learning, (3) principles of reaction, describing how teachers should encourage and respond to students, (4) support systems are all facilities, materials, or learning environments that support learning, and (5) instructional and nurturant effects learning outcomes are obtained directly based on the goals to be achieved and the results of the nurturing effects.

RADEC Learning Model

RADEC stands for Read, Answer, Discuss, Explain and Create. The RADEC learning model is one of the learning models that requires human resources to have high-level skills (Sopandi, 2017). (Handayani et al., 2019) explained that the RADEC learning model was developed based on national education goals. It creates all the potentials possessed by students to become human beings who believe in God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become good citizens, democratic and responsible. In addition, this

model was also developed based on constructivism theory which views cognitive abilities in children as developing through interaction with the social environment. In this theory, the term Proximal Development Zone (ZPD) is also known, which is intended to develop students'' self-potential so that there is time for students to study independently (Xi & Lantolf, 2020). It aims to see students' ability without the help of other parties and skills that can only be achieved with the help of other parties (potential development level).

The RADEC learning model views all students as having the potential and capacity to learn independently and higher learning to master knowledge and skills (Sopandi, 2017). On the other hand, (Ma'ruf et al., 2020) suggest that the learning process that allows students to carry out various activities during the learning process and involves students in determining the topics to be studied can develop thinking skills and provide a sense of ownership, responsibility, and involvement in education. In line with this, (Sopandi & Handayani, 2019) stated that the RADEC learning model had been proven to increase mastery of concepts and develop skills for students.

Validity & Effectiveness

In testing the quality of learning products, a researcher must conduct a series of trials to determine their validity, practicality, and effectiveness (Nieveen, 1999a). In this study, two tests were conducted, namely the validity and effectiveness test. The validity test is a test carried out by involving experts (Pandiangan et al., 2017). These experts were asked to assess the products produced by researchers, which included aspects of material, presentation, language, and others.

In addition to the validity test, this study also reviews the effectiveness test. The effectiveness test is a test that involves students to see how far the learning model developed can improve learning outcomes, attitudes, and other skills. (Eun Lee et al., 2020) stated that the effectiveness test was seen from the significant difference in scores between the pretest and posttest scores. In addition, the effectiveness test can also be carried out by looking at the number of n-gain scores, which are grouped into low, medium, or high categories (Rausch et al., 2016).

METHODS

Research Design

The design used in this study is part of research and development adapted from the theory of (Borg & Gall, 1989). (Nieveen, 1999b) mentions three quality criteria for developed products: validity, practicality, and effectiveness tests. However, this article only focuses on two types of product quality tests, namely validity and effectiveness. The validity test is aimed at experts to assess the products produced by researchers, while the effectiveness test is a product quality test that involving users (students) to measure the increase in student activity during the learning process.

Research Site and Participants

This research was conducted in 5 public junior high schools in Bone district, South Sulawesi, Indonesia. A total of 85 students from the five schools were involved in this study which was determined using the purposive sampling technique. Research participants are selected by researchers based on specific considerations related to the theme and purpose of the study. In addition to students, other participants involved in this study were two experts and five teachers. These experts are tasked with providing input, suggestions, and assessments of the products that have been developed in the validity test session, while the teachers provide data in the form of observations during the learning process.

Data Collection

Validation Sheet

A validation sheet is a research instrument used to collect data from experts. This validation sheet consists of several types, including: (a) model book validation sheet, (b) student activity observation of sheet validation, (c) student response questionnaire of validation sheet, and (d) Learning Implementation Plan (LIP). The validators are tasked with assessing the learning model product by giving a checklist on a scale of 4 questionnaire, which is very invalid = 1, less valid = 2, valid = 3, and very valid = 4. The following are presented some aspects that are assessed in the validation sheet.

Table 1. Aspects validated by experts

No	Validated	Aspect research product
1.	Learning Model Book	General aspect Material aspect
2.	Student activity of observation sheet	Visual activities Oral activities Listening activities Writing activities Motor activities Mental activities Emotional activities
3.	Student response questionnaire	Learning device components Novelty Understanding the content of teaching materials The feasibility of learning
4.	Learning Implementation Plan (LIP)	Format Content Language

Student Activity Observation Sheet

To test the effectiveness of this learning model, so student activity observation sheets were used to see student activities during the learning process. The researcher designed this questionnaire by containing several aspects, namely: (a) visual activity, (b) oral activity, (c) listening activity, (d) writing activity, (e) motor activity, (f) mental activity, and (g) emotional activity. This validation sheet is filled out by social studies subject teachers from 5 different state junior high schools.

Student Response Questionnaire

In addition to student activity observation sheets, effectiveness tests were also carried out by providing student response questionnaires to this RADEC learning model. This questionnaire provides four aspects of assessment: the completeness of learning tools, attractiveness, language aspects, and convenience. The student response questionnaire was designed with four answer choices; namely, the highest score was four, and the lowest was 1.

Data Analysis

Data from two experts during the validation process. And student responses were analyzed quantitatively to determine the average score. After obtaining the average score, the validation

results are compared with the criteria listed in table 2.

Table 2. Criteria for validity and student responses (Muhali et al., 2019; Ratumanan & Laurens, 2011)

Score interval	Rating Category
$3.6 \leq p \leq 4$	Very Valid/effective
$2.6 \leq p \leq 3.5$	Valid/effective
$1.6 \leq p \leq 2.5$	Less valid/effective
$1 \leq p \leq 1.5$	Invalid/effective

Furthermore, the observation data from the teachers were analyzed quantitatively to determine the overall percentage of student activity. After the percentage score is obtained, it is compared with the effectiveness category, as shown in table 3.

Table 3. Table of student activity criteria (Arini & Juliadi, 2018).

No	Score interval	Category
1.	$80\% < S \leq 100\%$	Very high
2.	$60\% < S \leq 80\%$	High
3.	$40\% < S \leq 60\%$	Enough
4.	$20\% < S \leq 60\%$	low
5.	$0\% S \leq 20\%$	Very low

RESEARCH RESULTS

Validity of RADEC Learning Model

Four RADEC learning model products are validated by experts, namely model books, student response questionnaires, student activity observation sheets, and Learning Implementation Plans (RPP). From the validation results, information was obtained that the four learning model products can be used because the results of the expert assessment have met the 'valid' and 'very valid' categories. Completely, the results of the validation can be seen in table 4.

Table 4. The results of the validation of the RADEC learning model

No	Validation tool	Average	Category
1.	Learning model book	3.58	Valid
2.	Student Response Questionnaire	3.69	Very Valid
3.	Student Activity Observation Sheet	3.90	Very Valid
4.	Lesson plan	3.60	Very Valid

From the validation results, it can be concluded that the RADEC learning model can already be used in the learning process. This is based on the results of content validation involving experts and showing scores that fall into the 'valid' and 'very valid' categories. The model book got a cumulative average score of

3.58 and was categorized as 'valid'. This is based on the table of validity criteria that has been set in the method section and is in the score range of $2.6 \leq P \leq 3.5$. Furthermore, the other three products fall into the 'very valid' category because they get an average score in the range of $3.6 \leq P \leq 4.0$.

The Effectiveness of the RADEC Learning Model

Results of Observation of Student Activity

The data from the student activity observation sheet assessed by the teachers were then analyzed and the results presented as shown in table 5.

Table 5. Percentage of student activity

	Mean	Persentase
1st meeting	3.5	87%
2nd meeting	3.5	87%
3rd meeting	3.4	85%
4th meeting	3.3	82%
Total	3.425	85.25%

From table 5 above, information is obtained that the four meetings during the learning process using the RADEC model have a very high level of student activity. At the first meeting, the percentage of student activity reached 87%, and so did at the second meeting. Furthermore, at the third meeting, the percentage of student activity from 5 schools reached 85%, and at the fourth meeting, it came 82%. Overall, the total average percentage of student activity levels from 5 schools reached 85.25%. This total percentage can be categorized as very high student activity because it is in the range of $80\% \leq S \leq 100\%$.

Student Response Questionnaire Results

Response questionnaires distributed to students from 5 schools were then analyzed to determine the average score and its percentage. This is done to see how effective the RADEC learning model is from the student's perspective. The results of the student response questionnaire analysis are presented in table 6.

Table 6. Results of student response questionnaires

No	School's name	Mean	Category
1.	School A	3.88	Very effective
2.	School B	3.94	Very effective
3.	School C	3.97	Very effective
4.	School D	3.975	Very effective
5.	School E	3.975	Very effective
	Total	3.94	Very effective

From table 6 above, it can be concluded that students' responses to the RADEC learning model are very positive. This is indicated by the results of their response analysis, which achieved a very effective average score. Overall, the total average score of student responses from 5 schools is 3.94 and is categorized as very effective. This is based on the overall average score, which is in the range of scores of $3.6 \leq S \leq 4.0$.

DISCUSSION

From the research results above, it can be concluded that the design of the RADEC learning model in Social Sciences subjects is declared

valid and effective. Validity is obtained based on expert assessments, and effectiveness is obtained through student activities and responses as users during the learning process. This means that the RADEC learning model can already be applied at the junior high school level to increase student activity in the classroom.

The RADEC learning model is closely related to active learning because student activity is the main component of active learning. Student activity is significant because, in the learning process, students themselves must actively process it first and cannot be obtained for granted (Irawan et al., 2017). Thus, active learning is a standard process and turned into a personalized process, including improving problem-solving skills, critical thinking, creative thinking, and others (Akinoglu & Tandogan, 2007).

In addition, the RADEC learning model is a type of active learning which has now become the primary strategy in the learning process. In a broad sense, active learning refers to a classroom strategy that moves away from the transmission model or classical education towards a learning model in which students are actively involved in problem-solving and knowledge creation (Freeman et al., 2014). In the active learning model, teachers can use many strategies, including individual inquiry, team-based problem solving, and class discussion (Soto & Marzocchi, 2020).

Still related to active learning, many studies state that this learning strategy has a positive impact on students. About 225 meta-analytical studies say that this strategy has had a better effect on various disciplines (Apkarian et al., 2021). In this case, active learning strategies are proven to reduce the failure rate than conventional/lecture strategies or methods. (Kustyarini, 2020) stated in the results of his study that active learning impacts increasing students' self-efficacy and emotional intelligence. Students who study using active learning tend to have a greater positive perspective than students who study using conventional methods (Mueller et al., 2015).

The application of active learning is, of course, not as easy as imagined. Many factors influence the success of this strategy in achieving learning objectives. (Demirci, 2017) states that sometimes teachers seem to be locked in a specific time allocation in active learning, so it is difficult to reach all the material and focus on one topic, which impacts teacher activities that only review superficial things. Another difficulty is controlling students from class noise and just watching, listening, and taking notes (Niemi & Nevgi, 2014). In addition, (Dolan, 2015) states that individual factors and classroom situations in active learning contribute to student performance, engagement, and persistence.

Talking about research on the RADEC learning model, many researchers have done it, especially in Indonesia. The RADEC learning model impacts learning outcomes, both material-oriented, namely understanding concepts and concepts of learning skills (Lukmanudin, 2018). In line with these findings, several researchers stated that the RADEC model positively impacted students' critical thinking skills (Jumanto et al., 2018; Pratama et al., 2019). Similar findings were also stated by Ilham et al. (2020) which confirm that the RADEC model has a higher impact than the discovery learning model in improving students' critical thinking skills.

Furthermore, (Zandvakili et al., 2018) provide that RADEC learning can encourage students to do various activities in learning so that they have a sense of ownership, responsibility, and involvement in learning. In linguistics, the RADEC model has also been shown to improve students' ability to write explanatory texts (Setiawan et al., 2019). From the reviews of some of these studies, it can be stated that the RADEC learning model has many advantages in the learning process. For this reason, it is appropriate for teachers to design the learning model according to the learning needs in their respective

places through the research and development process.

CONCLUSION

One of the determining factors for learning success is the achievement of the learning objectives that have been set. To suppress failure in learning, a teacher must increase student activity in the classroom so that learning is not just a process of transmitting or transferring knowledge. For that reason, the RADEC learning model is designed to achieve increased student activity in the classroom. This research is part of research and development that focuses on testing the validity and effectiveness of the product that the researcher has designed. The results showed that the RADEC learning model was valid and effective in increasing student activity. Validity is obtained from assessing experts who are competent in evaluating the research product, while effectiveness is obtained through data obtained from students while using the learning model. These findings provide a basis and input for teachers to design similar learning models to achieve learning objectives as expected.

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