# The Development Of The RADEC Learning Model To Improve Students' Activeness

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**Abstract**

This study aims to create a RADEC-based learning model in Social Science subjects to increase student activity. Research & Development (R & D) is a research design used by adopting the theory from Borg & Gall by summarizing it into four main stages, namely preliminary study, model design, development stage, and product testing stage. The participants involved in this study consisted of two experts, five teachers, and 85 grade VIII students from five different schools. Instruments were used for the data collection process, including observation techniques, document analysis, validation & observation sheets, teacher and student response questionnaires, and students' activeness observation sheets. The data collected was then analyzed qualitatively and quantitatively. The research findings state that students and teachers need a learning model to increase students' activeness. From the results of product trials, information was obtained that the learning model developed was proven to be valid, practical, and effective.

**Keywords**   Teaching Model, RADEC, Students' Activeness, Research & Development.

**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 (Sanchez-Cabrero et al., 2021; 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 (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 activeness 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). Kaharuddin (2020) found several benefits of this model in his research, namely: (a) allowing teachers to design their learning models attractively, (b) improving critical thinking skills, (c) improving analyzing and reading skills, and (d) 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.

**Literature Review**

**A. Students' Activeness**

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), activeness is an 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.

Activeness 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 activeness 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).

**B. 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.

## C. 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). Therefore, the task and role of educators are essential in directing and guiding students in this learning model. Sopandi & Handayani (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.

**Research Method**

**A.    Research Design & Participants**

Research is research and development that aims to create a product in a learning model, which is then tested to determine its quality. The R & D theory used in this study is the theory of Borg & Gall (2007) which states that there are ten steps of development, namely: (a) research & information collection, (b) planning, (c) develop preliminary form of product, (d) preliminary field testing, (e) primary product revision, (f) main field testing, (g) operational product revision, (h) operational filed testing, (i) final product revision, and (j) dissemination and implementation. For this study, the researcher summarized the ten stages into four: preliminary analysis, product design, development stage, and product trial stage.

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.

**B.   Data Collection**

Data collection in this study used several techniques. In the preliminary study phase, the researcher used observation and document analysis techniques to collect preliminary information about the learning needs of students and teachers. Furthermore, the data collection techniques used in the development phase were validation sheets, student activity observation sheets, and questionnaires.

**1.   Observation**

Observation is one of the oldest data collection techniques widely used in qualitative research. With this technique, data collection is done systematically and meaningfully, seeing and hearing particular objects (McKechnie, 2008; Smit & Onwuegbuzie, 2018). Observations are carried out by observing the target or focus of the research director and recording these events and behaviours reasonably and not engineered within a certain

period.

## 2. Document Analysis

Furthermore, research data was also collected through document analysis techniques. This technique obtains information or data related to the research theme by analyzing various documents (Mohajan, 2018). The documents analyzed in this study include textbooks or textbooks, the curriculum used, lesson plans, and others.

## 3. Questionaire

In addition, the 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.

## 4. The 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.

## 5. Students' Activeness Observation Sheets

To test the effectiveness of this learning model, so students' activeness observation sheets were used to see students' activeness 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.

## C. Data Analysis

Data analysis was carried out in research and development using two approaches, namely qualitative and quantitative. In the initial study phase, data was collected through observation. And document analysis was carried out qualitatively by interpreting the data into words and sentences. The results of this analysis become the basis for researchers to design learning products that suit the needs of teachers and students.

In addition to qualitative analysis techniques, this study also applies quantitative analysis techniques. The data collected in the development phase is then analyzed quantitatively to determine the quality of the resulting product, namely the level of validity, practicality, and effectiveness. 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 1.

Table 1. Criteria for validity and student responses by 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 2.

Table 2. Table of students' activeness criteria by 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 |

## Results

### A. Results of Need Analysis

From the analysis of the students, information was obtained that, in general, the activeness of the students of Junior High School of Ajangale, Bone Regency is still relatively low. The results of observations of student learning activities, especially for class VIII, show that the level of student activity is still low, as evidenced by the initial observation data that can be seen from the learning process, which shows that: (1) students find it difficult to give opinions; (2) students lack confidence in asking for reasons of fear of being wrong; (3) students tend to be passive in group discussion activities; and (4) students are less enthusiastic about participating in lessons as well as in completing LKPD. In addition, it can be seen in the recap of learning activities that still get the category of student learning activity is 75%.

The results of observations show that generally, the learning model used by the teacher has several weaknesses. In general, there are three weaknesses in question, namely: (a) only a small number of teachers use cooperative learning models, (b) the use of learning models is

not under learning theories which have implications for students' activeness, (3) learning is still teacher-centered with the direct learning method. Ideally, optimal learning should determine the choice of the type of model used in learning. This is considered important considering the application of the learning model can optimize student activity and impact learning outcomes.

Third, the analysis of learning objectives is carried out to get a picture of students' success as set out in the lesson plan (RPP). In the initial observation, it was found that the achievement of learning objectives was still relatively low. This is evidenced by several findings during the preliminary study process, namely: (a) mastery of subject matter for teachers still needs to be improved, (b) most teachers equate students' abilities in absorbing lessons, (c) teachers still need to motivate children in learning, and (d) teachers need learning models that can increase student activity. From the initial study results, it can be concluded that a learning model that can increase student activity is needed. For that reason, the researchers developed this learning model to help teachers achieve learning goals.

## B. Overview of Design Requirements

The RADEC model is designed in a model book consisting of four chapters, namely introduction, supporting theory, learning model concepts, and model implementation. In part I, the model book is designed by listing several main components, namely rationale, name, purpose, benefits, development basis, educational philosophy foundation, and constitutional juridical basis. In the second chapter, the arrangement of material in the context of the theory supporting the learning model consists of relevant learning theory, sociocultural or cognitive theory, Bruner's learning theory, Piaget's learning theory, and Vygotsky's learning theory.

Furthermore, in the book's third part, the learning model is classified into several sub-sections. In this chapter, the concept of the learning model is divided into four parts, namely the idea of the learning model, the characteristics of the learning model, the advantages of the learning model, and the syntax of the learning model. Finally, in chapter IV of the model book, several sections are also presented, including model planning, model implementation instructions, model syntax implementation, social system application, reaction principal application, support system, and assessment.

As with any learning model, one aspect that must be considered is syntax. The syntax is the learning stage starting from the opening activity until the learning ends. The learning process can run systematically according to these stages with this syntax. The syntax in this learning model is: (a) reading, (b) answering, (c) orientation, (d) discussion, (e) explaining, (f) creating, (g) evaluation, and (h) assessment. The following is a picture of the model book that has been developed.
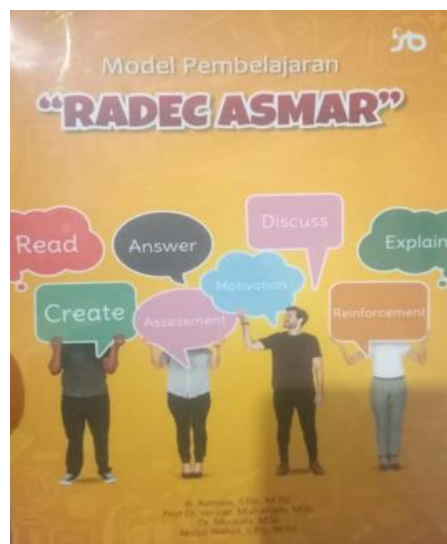
Picture 1. Cover of learning model book

## C. Validity, Practicality, & Effectiveness

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 3.

Table 3. The results of the validation of the RADEC learning model

| Validation tool | Average | Category |
|---|---|---|
| Learning model book | 3.58 | Valid |
| Student response questionnaire | 3.69 | Very valid |
| Student activity observation sheet | 3.90 | Very valid |
| 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 data from the student activity observation sheet assessed by the teachers were then analyzed and the results presented as shown in table 4.

Table 4. Percentage of students' activeness

| | Mean | Percentage |
|---|---|---|

| | | |
|---|---|---|
| 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 4 above, information is obtained that the four meetings during the learning process using the RADEC model have a very high level of students' activeness. At the first meeting, the percentage of students' activeness reached 87%, and so did at the second meeting. Furthermore, at the third meeting, the percentage of students' activeness from 5 schools reached 85%, and at the fourth meeting, it came 82%. Overall, the total average percentage of students' activeness levels from 5 schools reached 85.25%. This total percentage can be categorized as very high students' activeness because it is in the range of $80\% \leq S \leq 100\%$.

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 5.

Table 5. 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 5 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 $3.6 \leq S \leq 4.0$.

The analysis of the practicality of the RADEC model was measured through two aspects, namely the model implementation questionnaire and the teacher response questionnaire. Based on the model implementation questionnaire, the average value was 4.94 with a percentage of 98.75%. Furthermore, the practicality test conducted through a teacher response questionnaire of 6 people in public junior high schools throughout the Ajangale sub-district, Bone Regency, South Sulawesi, Indonesia, obtained an average score of 95.83%. From the results of the two

tests, it can be stated that the RADEC learning model is practical and can be used more widely in the field.

Finally, to determine the quality of the learning model, the effectiveness test is carried out by looking at the student activity responses and student responses. The data from the student activity observation sheet assessed by the teachers were then analyzed and the results presented as shown in table 6.

Table 6. Percentage of student activity

|  | Mean | Persentage |
|---|---|---|
| 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 6 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 $80\% \leq S \leq 100\%$.

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| 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 7 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 $3.6 \le S \le 4.0$.

## Discussion

One of the teacher's tasks is to design their learning model tailored to students' needs. The first step in developing a learning model is to conduct an initial study, commonly referred to as a needs analysis. The activity was carried out to obtain preliminary and in-depth information about the needs of students and teachers (Sönmez, 2019; Watkins & Kaufman, 1996). Not much different from this definition, experts define needs analysis as the process of identifying gaps between current learning outcomes and what is expected (Dahiya & Jha, 2011; Kaufman, 1998; Kaufman et al., 1993).

The product has been designed; a trial is carried out to determine the level of quality of the product. From the research results above, it can be concluded that the design of the RADEC learning model in Social Sciences subjects is declared valid, practiced, and effective. Validity is obtained based on expert assessments, practicality is determined through teacher responses and implementation of learning, 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; Yoga Adi 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. Based on the preliminary study, teachers and students need a learning model that can help increase student activity. Therefore, the researchers designed a learning model based on RADEC (Read, Answer, Discuss, Explain, and Create) to achieve learning objectives in Social Science subjects for class VIII students (Junior High school's students). Before being widely used, this learning model was tested for quality through three tests: validity, practicality, and effectiveness tests. The results showed that the RADEC learning model was valid, practiced, 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. On the other hand, practicality is assessed from the teacher's response to the learning model and the results of observing the implementation of the learning. These findings provide a basis and input for teachers to design similar learning models to achieve learning objectives as expected.

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