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Application of a Resource-Based-Learning (RBL) Approach to Improving Student Learning Outcomes on the Substance of Alkaline and Soil Alkaline

Sitti Rahmawati[1*], Magfirah Magfirah[1], Afadil Afadil[1], Budiono Budiono[2]

[1]*Faculty of Teacher Training and Education Tadulako University, Palu, Indonesia*
[2]*Public Senior High School 1 Palu, Central Sulawesi, Indonesia*

Corresponding author. Email: sittirahmawati@yahoo.com

ABSTRACT
This study aims to improve student learning outcomes on the subject of Alkalis and Soil Alkalis through the application of Resource Based-Learning (RBL). The problem studied in this classroom action research (CAR) is whether applying the Resource-Based Learning *(RBL)* approach can improve learning outcomes for students on the subject of Alkalis and Alkaline Earths? To answer the problems above, data collection was carried out by following the CAR flow, namely planning, implementation, observation, and reflection. Alkaline and Alkaline Earth materials are learning materials that can use a variety of other learning resources to better understand them. The data collection technique used is observation and the provision of learning outcomes tests at the end of each action. The results of data processing showed that there was an increase in student learning outcomes, both in terms of the average value per cycle and the percentage of classical completeness. The average value in the first cycle was 66.68, in the second cycle it was successfully increased to 74.26 and in the third cycle, it rose again to 78.69. Regarding the classical completeness that was successfully obtained in the first cycle it reached 92.68%, in the second cycle it was successfully increased to 95.12%, and in the third cycle, the classical completeness reached 100%. Thus, based on the results of the study, it shows that Resource Based-Learning (RBL) learning can improve student learning outcomes on the subject of Alkali and Alkaline Soils.

Keywords: *Learning Outcomes, Resource-Based Learning (RBL), Alkali, Soil Alkali*

1. INTRODUCTION

One of the factors causing the low interest and value of students in learning chemistry is the way of teaching that is only one way, where the teacher is watching to explain without looking at the condition of the students whether they understand or not [1]. According to Bojowoye, 2014 [2] and Peter 2014 [3], in the process of teaching and learning activities, teachers are not the only source of learning for students (teacher-centered), but what is more expected is that learning is student-centered. In this condition, the teacher or instructor functions more as a learning facilitator. So, students should actively interact with learning resources, in the form of classmates, principals, teaching materials or materials in the form of books, student worksheets (LKS), and various learning resources and facilities such as computers, libraries, laboratories, and the environment [4, 5].

One of the teaching materials in class XII IPA is alkali and alkaline earth, which discusses the physical and chemical properties of alkali and alkaline earth groups, their existence in nature along with their extraction processes, and their applications in everyday life [6]. Based on the materials that will be taught in alkaline and alkaline earth shows that the teacher is not the only source of learning. Students can study in the Laboratory, Library room, internet, and special learning resource rooms or even outside the School if students study the environment related to alkaline and alkaline earth materials.

Based on the results of interviews obtained from chemistry teachers at SMAN 1, problems were found in the learning process, especially the subject of Alkali and Alkali Tanah, namely student activity was still lacking in the process of teaching and learning activities. Class XII IPA 6 students are less serious in accepting subjects such as Physics, Mathematics, and Chemistry, and also practice in the laboratory is rarely done. Students are afraid to ask questions, students' interest in finding learning resources is still low and most students do not reach the Minimum Completeness Criteria (KKM). The

KKM value that has been set by SMAN 1 Palu for class XII is 65%. Where from 41 students of class XII IPA 6SMAN 1 Palu classical completeness only about 46.34 % of students who complete this material and 53.66% of other students (22 students) have not reached the criteria of classical completeness. If this happens continuously, Student learning outcomes are unlikely to increase.

Alkali and Alkali Earth are learning materials that can use a variety of other learning resources to better understand them. Learning by using the lecture method alone is not enough to attract students' interest in learning. According to Saguni, 2006 [4], learning will be more interesting if it uses many learning resources. One of them is the laboratory, library, internet, and other learning media which is a tool or intermediary in conveying messages or information from teachers to students. Through a variety of learning resources, students will more easily accept and understand the material presented by the teacher. Because it is real, students can think concretely about the information they receive. So, learning for students is a very fun thing. According Suwantarathip, 2010 that learning will be effective if it is done in a pleasant atmosphere. So, learning can be successful if it is supported by a pleasant situation for students.

One of the efforts to improve student learning outcomes is by learning based on sources or " Resource-Based Learning " hereinafter abbreviated as RBL. This way of learning gives student the freedom to look for other learning resources. One of the characteristics of Resource-Based Learning (RBL) is to make full use of all sources of information as a source for lessons and provide opportunities to plan learning activities taking into account the available resources.

Based on this thought, the application of the Resource-Based Learning approach needs to be done through a classroom action research (CAR) with the following title: " The Application of the Resource-Based-Learning (RBL) Learning Approach to Improve Student Learning Outcomes for Class XII IPA 6 SMAN 1 Palu On the subject of alkaline and alkaline earth ". With the formulation of the problem whether applying the Resource-Based Learning (RBL) learning approach can improve student learning outcomes for class XII IPA 6 SMAN 1 Palu on the subject of Alkali and Soil Alkali.

2. LITERATURE REVIEW

2.1 Learning Outcomes

Learning outcomes are the result of the learning process carried out by students. Student learning outcomes are shown by the abilities possessed after learning which include the cognitive, affective, and psychomotor fields. Student learning outcomes are influenced by several factors, both from within (internal) and from outside (external). According to Andini, 2016 [7], internal factors include psychological and physiological factors (intelligence, achievement motivation, and cognitive abilities). Meanwhile, external factors include environmental and instrumental factors (teachers, curriculum, and learning models). The use of appropriate learning models, methods, and approaches is an important part of creating good learning conditions. Teachers play a very important role in creating conducive learning conditions to encourage student learning success [3, 8]

2.2 Resource Based Learning

Resource based learning (RBL) is a learning approach that is designed to be carried out by utilizing various learning resources both printed and non-printed, students are given the freedom to choose their learning sources as material for solving problems and concluding their findings [9]. According to MacCrate and Carnegie in [10] RBL can enhance students' ability in fixing sensible problems. student have the possibility to construct a wide information due to the fact that every students not accumulate the identical resources. Students challenged to actively collect as much information as possible It is hoped that this will encourage students to learn in a way that best suits their talents and abilities.

3. METHODS

This research was conducted at SMA Negeri I Palu, Central Sulawesi Province. The research subjects were students of class XII IPA 6 with a total of 41 students consisting of 15 males and 26 females. The implementation of the action was carried out during chemistry lesson hours (according to the lesson schedule at SMA Negeri I Palu) in a predetermined class, namely XII IPA 6. The duration of the action was 6 meetings divided into three cycles. Factors understudy are student factors and teacher factors. Student factors consist of student responses to *Resource-Based Learning*, student activity, and of course student learning outcomes obtained after applying the *Resource-Based Learning* approach. Teacher factors consist of the teacher activity studied in implementing the *Resource-Based Learning* approach and the ability to motivate students.

3.1 Activity Procedure

3.1.1 Planning.

Students are grouped into heterogeneous discussion groups based on their academic abilities and are given teaching materials in the form of Student Worksheets (LKS). At the implementation stage, the action plans taken to maximize student learning outcomes are:

- Assign chemistry teacher Kusrini S.Pd as an observer.
- Prepare teaching materials and lesson plans by applying the RBL approach.
- Make Sheet Working Students (LKS) is based on RBL to be used by students.
- Make a student assessment observation sheet consisting of two aspects, namely the affective aspect and the psychomotor aspect

- Make an observation sheet for teacher activities in teaching and learning activities
- Prepare for the test of learning outcomes.

3.1.2 Implementation

The action was carried out six times in three cycles. The target of the action is the student, the giver of the action is the teacher and the type of action is the Resource Based-Learning approach. The implementation of the action is divided into three stages, namely the initial stage (opening/introduction), the core activity stage, and the final or closing stage.

In the early stages of teacher activities, among others; Delivering greetings, attending attendance, presenting material titles, stating learning objectives, generating initial knowledge, forming groups, explaining student assignments in groups, motivating students. While the initial activities of students include; Responding to greetings, responding to attendance, paying attention to goals, listening to material explanations, sitting in groups, sitting in groups, and receiving student worksheets (LKS) given.

At the core activity stage, the teacher carries out several activities or actions such as asking students to understand student worksheets (LKS), asking students to do assignments according to student worksheets, helping and guiding students to work together in groups. The student activities at the core activity stage include; understanding worksheets, doing assignments according to worksheets, approaching various sources or RBL, working together, and presenting the results of discussions [11].

Furthermore, the final activities are; respond to the results of group work, conclude, give a final test and end the lesson. While the student activities at this stage are, paying attention to the teacher's conclusions, completing the final test questions, and responding to closing greetings.

3.1.3 Observation

Observations were made before and during the implementation of the action. Observing the implementation of the action by using an observation sheet for teachers in the form of an observation sheet on the implementation of RBL in the learning process where the teacher acts as a motivator and facilitator and provides encouragement to students to be able to solve the problem of Alkaline and alkaline earth. Meanwhile, for students, the actions were taken by observing the affective, psychomotor, and affective aspects. Students are required to find their learning resources. In addition, students are allowed to learn about alkaline and alkaline earth materials according to their respective abilities and speeds without coercion [11].

3.1.4 Reflection

Reflection is intended to identify the strengths and weaknesses of the actions that have been taken. The sources of information for reflection are the results of teacher and student observations and the results of the final test. teacher and student observations and the results of the final test. Aspects that have been assessed as good in previous actions are maintained in subsequent actions while existing weaknesses are discussed together and then look for solutions to improve these weaknesses [12]. Thus, researchers make this reflection stage a medium for the revision of actions. Reflection is getting matured at the end of each cycle.

3.2 Data analysis Techniques

In classroom action research, an increase in student learning outcomes as a result of action which is the most important aspect is expected. Therefore, the analysis used is closely related to the analysis of student learning outcomes such as analysis of absorption, learning completeness, and average scores [11, 13, 14].

4. RESULT AND DISCUSSION

The description of the data from the observations of teacherand student activities can be seen in Table 1 and Table 2.

Table 1. Observation Results of Teacher Activities in Learning RBL Cycles 1, 2 and 3

Activity	Action score per cycle					
	1		*2*		*3*	
	1	*2*	*1*	*2*	*1*	*2*
Doing daily activities	5	4	5	5	5	5
Submit a topic	4	4	4	5	4	5
Delivering a goal	5	4	5	4	4	5
Explain the importance of the material and generate students' prior knowledge	4	3	4	4	5	4
Form a group	5	5	5	5	5	5
Explain individual and group tasks and group responsibilities	2	2	3	4	4	5
Directing students to find and collect information from various sources	4	2	3	5	5	5
Directing students to use the information obtained	5	4	4	5	4	5
Directing students to synthesize information	2	3	3	4	4	4
Explain to students to understand and complete LKS	2	3	4	4	4	4
Directing students to carry out presentations	5	4	4	4	4	4
Organize feedback and feedback	2	3	4	4	4	5
Help smooth presentation	3	4	3	4	4	4

Responding to learning	2	3	4	4	5	5
Carry out evaluation	2	3	4	4	4	4
Carry out daily activities	2	4	3	3	4	4
Amount	54	55	62	68	69	74
Average	3.38	3.44	3.88	4.25	4.31	4.63
Average per cycle	3.41		4.06		4.47	
Predicate	Enough		Well		Very good	

Based on the Table 1, it can be seen that the development of teacher activities in each cycle through the application of the *Resource Based-Learning* approach is increasing. This can not be separated from the improvement efforts made by the teacher based on the suggestions and reflections of each cycle. Of course, the teacher's activities in each cycle can affect student activities in participating in learning. To find out the results of observing student activities, the data is presented based on Table 2.

Table 2. Observation Results of Student Activities in RBL Cycles 1, 2 and 3

Activity	**Action score per cycle**					
	1		***2***		***3***	
	1	***2***	***1***	***2***	***1***	***2***
Doing daily activities	3	3	4	4	5	4
Pay attention to the topic	3	4	3	4	4	5
Pay attention to goals	3	3	4	4	5	5
Pay attention to material descriptions and involvement in the generation of prior knowledge	3	3	3	3	4	4
Involvement in group formation	3	3	4	5	4	5
Understand group duties and responsibilities	2	3	3	4	4	4
Search and collect information from various sources	4	3	4	5	5	5
Using the information obtained	4	4	5	5	5	5
Synthesize information	4	4	4	5	5	5
Understand and complete LKS	2	3	3	4	3	4
Sharing in groups	3	3	3	4	3	4
Carry out presentations	3	3	3	4	4	4
Responding to learning	3	3	4	3	3	3
Prepare the final answer formulation/report	3	3	3	4	4	4
Following the evaluation	3	3	3	3	4	4
Carry out daily activities	3	3	3	3	3	3
Amount	49	51	56	64	65	68
Average	3.06	3.19	3.50	4	4.06	4.25
Average per cycle	3.13		3.75		4.16	
Predicate	enough		Good		good	

From the Table 2, it can be seen that all aspects observed have increased student activity in following the *Resource Based-Learning* approach. The increased activities include student activity in group work, active search for learning resources related to alkaline and alkaline earth materials, and using the information they get to complete worksheets because they already understand the core purpose of RBL learning is individual and group activity.

Learning and teaching activities are two concepts that describe the activities carried out in a research process, both of which cannot be separated from each other. According to Pathuddin et al [15], learning outcomes are the results achieved by a person after carrying out learning activities and are an assessment achieved by a student to determine the extent to which the lessons or materials taught have been accepted by students. To be able to determine whether or not the learning objectives are achieved, an attempt is made to assess learning outcomes. This assessment aims to see the progress of students in mastering the material that has been studied and determined.

The results of the assessment of student learning outcomes in this study can be seen from the data regarding the results of the evaluation (formative tests) given to students after each action. To find out quantitatively the results of students' formative tests for each cycle described by actions, it can be observed in the Table 3.

Table 3. Student Evaluation Results in Cycle 1, Cycle 2, and Cycle 3

Score	**Cycle 1**	**Cycle 2**	**Cycle 3**
Amount	2750.5	3014.5	3225
Absorption	67.09	73.53	78.65
Average	67.09	73.53	78.65
% Completeness	82.93	93.90	97.56

As the data presented in Table 3 shows that in cycle one the average value achieved was 67.09. The minimum standard for learning mastery that has been set is 65. This means that the standard is already too high as a whole, although individually there are still some students who have not succeeded in achieving that standard. The average value in the second cycle was successfully increased to 73.53 and in the third cycle, it rose again to 78.65.

Thus, in terms of learning outcomes, especially the average value achieved in alkaline and alkaline earth learning using *Resource Based-Learning* (RBL), there is an increase in each cycle. The increase in the average value is indeed not too large per cycle, but it shows a dynamic. Furthermore, it is strengthened by highlighting the achievement of classical completeness.

The classical completeness that was successfully obtained in the first cycle reached 82.93%, which means that there were still seven students who had not completed individually because the score had not reached 65. In the second cycle, it was successfully increased to 93.90%, meaning that those who did not complete individually were reduced to three people, and finally in cycle three classical completeness reached 100% in action two, meaning that there were no more students who did not complete individually, in other words, all students in cycle three had received a minimum score of 65.

Based on the discussion that has been stated above, it is firmly concluded that both in terms of the level of student activity and the learning outcomes that have been achieved in learning alkaline and alkaline earth materials using *Resource Based-Learning* (RBL), it turns out that everything experiences dynamics or increases from the cycle. one to cycle two and from cycle two to cycle three. There is an increase in student learning outcomes because RBL can make full use of all sources of information as a source for lessons and provide opportunities to plan learning activities taking into account the available resources, developing confidence in students in terms of learning. By applying the application based on various sources students are led to be active, whether he learns according to certain steps or according to their thoughts to solve the problem. Teachers in this case can only provide guidance, encouragement, and correct errors, and provide an assessment of the results of student work [16, 17].

The results of this study are in line with research by Khaerani, 2009 [18] and Widiana, 2016, [19] which also shows an increase in students' creative thinking skills from cycle I to cycle II, which also shows an increase in students' creative thinking skills from cycle I to cycle II, an increase in student test results, and student learning completeness. Research by William 2008 [20] and Rumahlatu, 2021 [21] also shows that resource-based learning (RBL) and Resource-based learning design thinking (RBLDT) methods are very effective in improving students' mastery of chemistry material with excellent interpretation.

5. CONCLUSIONS

Based on the results of the study, it was shown that Resource Based-Learning (RBL) learning can improve student learning outcomes in class XII IPA 6 SMAN 1 Palu on the subject of Alkali and Alkali Soil both in terms of the average value per cycle and the percentage of classical completeness. The average value in the first cycle was 66.68, in the second cycle it was successfully increased to 74.26 and in the third cycle, it rose again to 78.69. Regarding the classical completeness that was successfully obtained in the first cycle it reached 92.68%, in the second cycle it was successfully increased to 95.12%, and in the third cycle, the classical completeness reached 100%.

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