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Implementation of reflective pedagogical paradigm approach on the rate of reaction to student achievement

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Abstract. This study aims to determine the differences of learning by using the Paradigm Pedagogy Reflective (PPR) approach to student achievement of class of eleventh science Senior High School De-Britto College of the academic year 2017/2018 on the rate of reaction topic. A quasy experiment was conducted with posttest only control group design. The research sample consisted of two classes determined by cluster random sampling technique obtained experiment class with 23 students using PPR approach and control class with 22 students using contextual approach. Data were collected by multiple choice posttest of the rate of reaction topic, and reflection sheet. There were differences in the application of learning by using PPR on the rate of reaction topic of student achievement obtained by significance value with anova test student achievement smaller than significance level. Filling the reflection sheet was resulted, the students felt happy, there was no difficulty in understanding the material. The value obtained cooperation, togetherness and thoroughness. In a real action, students will learn harder, help friends in learning. Therefore, the PPR approach can be applied in chemistry learning. There are different implementation of PPR approach with contextual approach to student achievement on the rate of reaction topic of students of eleventh science Senior High School De-Britto College.

1. Introduction
Education has an important role in the survival of human life in order to develop the potential of the future young generation of future leaders both as a personal person and society. Based on the Law of the Republic of Indonesia Number 20 Year 2003 Article 1 paragraph 1 regarding of the National Education system defines: Education is a conscious and planned effort to create an atmosphere of learning and learning process so that learners actively develop their potential to have spiritual spiritual power, self-control, personality, intelligence, noble character, as well as the skills that he needs, society, nation and state. Based on the definition of education it can be understood that education guidance to grow and develop in the process of forming intelligent and skilled man, achieve a whole, balanced and optimal life. Education is a human endeavor to cultivate and develop the innate potential of both body and spirit with the values that exist in society and culture [1].

Learning is a process undertaken by the individual to acquire a new behavior, as a result of the individual's own experience in the context of his social interaction [2]. Learning achievement is a proof of the success of learning or the ability of a student in doing learning activities in accordance with the weight achieved [3]. The test of learning achievement when viewed from the goal is to reveal the success of someone in learning. Understanding of learning achievement is something that can be
achieved or can not be achieved. In implementing the learning process students will gain knowledge, experience, and skills [4].

The approach can be interpreted as a starting point or point of view of the learning process [5]. The selection of learning approaches is endeavored by a fun process and has meaning in daily life by linking material to real-world situations and encouraging students to make the knowledge connections gained by application in life so that students can find meaning and meaning useful to their later life. Contextual learning approach aims to help students understand the meaning of the lesson by connecting to the context of life in the environment and society. Learning not only affect learning outcomes as learning objectives but the knowledge and experience gained will be beneficial in real life. The contextual approach is a learning approach that links between the material learned and the real students' daily life, whether in the family, the school, the community or the citizens, in order to find the meaning of the material for their life [6].

This PPR lesson emphasizes the importance of the reflection learning process as outlined in a concrete action. PPR invites students to look deeper into the meaning of a learning through understanding embodied in action that is expected to emerge through action in everyday life. Education is considered successful when students themselves find the knowledge, understanding, skills, and values, and the teacher's job is as a facilitator [7, 8].

The Paradigm of Reflective Pedagogy can be defined as follows: Paradigm is a process of thinking pattern and acting pattern in learning [9]. Pedagogy is a method in which a teacher will accompany the student to grow and develop according to his personality. Reflective is the process of activities to understand, understanding the essential values of what is learned/spiritualitas process being able to find the link between what is learned (aspects of knowledge) with human values that ultimately (implication) is appreciative a continuous search process to fight for truth and freedom. There reflect learning means to understand more deeply what is experienced, especially to seek what is the meaning of teaching materials in order to solve the problems [10, 11].

The process of learning PPR can improve motivation to learn by involving students as a critical agent in the learning process. This makes the learning process more personal because it brings the experience of teachers to the students. So reflective is an approach of developmental facilitation patterns for students both intellectually and emotionally to help develop a full and balanced human person [12-14].

From the meaning of paradigm, pedagogy, and reflective it can mean that understanding PPR is a learning approach by applying reflection in every process to get meaning based on hierarchy of values, norms and conscience. It determines responsible behavior by upholding humanity. The approach of learning by giving students an experience possessed not only convey learning with a knowledge framework. In the learning cycle of the implementation of PPR, there are five steps: context, experience, reflection, action and evaluation [15].

Based on the above background, it can be defined the purpose of this study as follows: to examine the differences in the application of PPR and contextual approach in learning in terms of student achievement of learning using PPR approach of class of eleventh science nature science Senior High School De Britto College on the rate of reaction topic based on student achievement. PPR approach is done by teacher so it that can assist students in their growth and development. The art and science of teaching can not only be reduced to a methodology but also can provide a goal, an end to which all aspects of the educational tradition are directed, and the criteria for choice of means to be used in the educational process. [16]

The benefits of research applying this PPR approach can improve a full understanding of many things that are gained, including on attitudes, and humanitarian values. The reflection will form the conscience of beliefs, values, attitudes, and the whole way of thinking so that it will pass the stage of understanding, be the stage of action to take responsible decisions in daily life. The PPR approach with 5 steps: context, experience, reflection, action and evaluation is done with good preparation and planning. It is expected that the values to be obtained by the students become meaningful so that they can grow into an independent person, competent, intact and responsible.
2. **Research Method**

The type of research used is quasy experiment, using post-test only control group design. The sample of research is students of class of eleventh grade of science 5 class with 23 students as experimental class and eleven grade of science 4 with 22 students as control class.

Technique of collecting data is in the form of test. The test was conducted with the aim to know the level of knowledge and understanding of students on the material rate of reaction after the implementation of PPR approach and learning with the contextual approach that is usually done in school, the test is carried out after the implementation of the research. Instrument data collection used are: test, validity and reliability of the instrument. Data analysis techniques include descriptive analysis, statistical analysis, normality test, and homogeneity test.

3. **Results and Discussions**

The result of the research are presented data of student achievement test result is shown in Table 1.

<table>
<thead>
<tr>
<th>Description</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Score</td>
<td>87.96</td>
<td>83.27</td>
</tr>
<tr>
<td>Highest Score</td>
<td>100</td>
<td>97</td>
</tr>
<tr>
<td>Lowest Score</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Deviation Standard</td>
<td>6.72</td>
<td>5.81</td>
</tr>
</tbody>
</table>

Based on Table 1 there is an average of 87.96 for the experimental class and 83.27 for the control class. The highest score in the experimental class reaches 100, for the control class 97, for the same lowest value of 77, whereas the standard deviation is 6.72 for the experimental class and 5.81 for the control class. The frequency category of student achievement test is shown in Table 2.

<table>
<thead>
<tr>
<th>Category</th>
<th>Score Range</th>
<th>Experiment Class</th>
<th>Control Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of students</td>
<td>%</td>
<td>Number of students</td>
</tr>
<tr>
<td>Very High</td>
<td>X&gt; 94</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>High</td>
<td>90 &lt; X &lt; 94</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Medium</td>
<td>87 &lt; X &lt; 90</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Low</td>
<td>83 &lt; X &lt; 87</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Very Low</td>
<td>X ≤ 83</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

Figure 1. Frequency distribution of student achievement
The results are shown from table 2 on the frequency of student achievement test categories in the experimental class with very high category 13%, for the control class 4.5%. The low category is showed from the score ≤ 83 in experimental class 17.4% for control class more 45.5%. This corresponds to the average experiment class of 87.96 and control class of 83.27. This score is good because it is above the value of KKM i.e 77. However, the experimental class is much better if calculated combined value with the category high, medium and low obtained percentage 69.6% and control class 50%. The frequency distribution of student achievement is shown in Figure 1.

Anova test was performed to obtain significance data as shown in Table 3.

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>246.680</td>
<td>1</td>
<td>246.680</td>
<td>6.227</td>
</tr>
<tr>
<td>Within Groups</td>
<td>1703.320</td>
<td>43</td>
<td>39.612</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1950.000</td>
<td>44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result of the Anova test shows that the significance value of learning achievement is 0.016; this means that the significance value is smaller than the significance level of 5%. It can be concluded that there are significant differences to the application of PPR approach and contextual approach in learning and student achievement.

PPR approach after the students get experience then do the reflection with the aim that what has been obtained can be impregnated students in more depth. The following is a data sheet of reflection, there are two data that is for the meeting to 1-4 is done after the lesson ends and the 5th meeting is done after completion of learning about the material that has been obtained.

This data indicates that the PPR approach is good, students feel happy and can follow the learning with a good understanding. If the data is combined from 5 meetings, the students write 88% happy statement, 12% unhappy, 70% easy, 30% difficult. The prior point to the test Anova conducted prerequisite tests consisting of normality test, homogeneity, and correlation test between variables. The average score of 87.96 experimental class learning achievement and control class 83.27.

Normality tests was performed for normal or abnormal distributed data. This test uses Kolmogorov Smirnov method, using SPSS 24 program. It obtained significance score of experimental class of is 0.107 and control class equal to 0.108. Based on the data, it is concluded that the students' learning achievement is normally distributed.

Homogeneity tests were performed for homogeneously distributed or non-homogeneous distributed data. This test used the Kolmogorov Smirnov method. It obtained a significance score of learning achievement of 0.379 with a significance value greater than 0.05 with a significance level of 5%. This shows the same data variance. Based on the data, it can be concluded that experimental class and control class is homogeneous.

The next step was tested by Anova test of learning achievement test of significance of student achievement of 0.016. This Anova test shows a significance smaller than the 5% significance level. This analysis means that there is a significant difference between the PPR approach and the contextual approach on the the rate of reaction topic to the students' achievement of class of eleventh science Senior High School De Britto College. Relevant research was suggested that students' learning achievement with high activity was better than the students' learning achievement with medium learning activity, whereas students with high activity were better than the students' learning achievement with low activity, and students' learning achievement with medium activity was better than achievement students with low activity on the subject matter of triangular area [17].

The experimental classroom learning process with the PPR approach has context, experience, reflection, action and evaluation steps. Evaluation is done by post test of learning achievement to measure the extent to which students can understand the material of the reaction rate that has been obtained during the process that has been done. Relevant research has suggested that reflective learning has a positive effect on biology learning on student learning outcomes [18].
4. Conclusion
Based on the results of the analysis of research data, it can be drawn conclusion as follows: there are some differences in the application of PPR approach with a contextual approach to student achievement on the rate of reaction topic of implementation of learning using PPR approach. It is better using PPR approach than contextual approach to student achievement in the of eleventh grade of science of De Britto Senior High School.

Learning with PPR approach is better than contextual approach, then teacher can give opportunity to student to PPR in subsequent material so that student did not only receive lesson from one direction, listen to lecture from teacher but student itself active in learning. Teachers should have extensive experience of the lessons delivered. In time students ask many things and teachers can explain with good analysis and relate to daily life around us. The implementation of classroom learning is planned and programmed by taking into account the situation and the student environment so as to find the appropriate context and provide space for the students to provide an in-depth experience, and invite students to actively perform the 5 steps contained in the PPR, so that the teacher can know student's better progress.

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