PERBANDINGAN EFEKTIVITAS PENERAPAN MODEL PEMBELAJARAN *PROJECT BASED LEARNING* (PjBL) DAN *PROBLEM BASED LEARNING* (PBL) PADA MATERI SISTEM KOLOID TERHADAP NILAI KARAKTER DAN PRESTASI HASIL BELAJAR KIMIA

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ABSTRAK

Penelitian ini bertujuan untuk mengetahui peningkatan nilai karakter dan prestasi belajar kimia peserta didik kelas XI MIA SMA Negeri 7 Purworejo dengan membandingkan model pembelajaran *Project Based Learning* (PjBL) dan *Problem Based Learning* (PBL) pada materi sistem koloid.

Sampel penelitian terdiri dari 52 peserta didik yang selanjutnya dibagi menjadi dua kelas. Kelas eksperimen 1 terdiri atas 26 orang peserta didik yang menerapkan model pembelajaran *Project Based Learning* (PjBL) dan kelas eksperimen 2 terdiri dari 26 peserta didik yang menerapkan model pembelajaran *Problem Based Learning* (PBL). Instrumen penelitian yang digunakan untuk mengetahui peningkatan nilai karakter dan prestasi belajar kimia peserta didik adalah berupa angket nilai karakter dan soal prestasi belajar kimia untuk materi sistem koloid. Desain pengamatan dilakukan secara berulang (*pretest-posttes*t).

Hasil penelitian menunjukkan bahwa (1) ada perbedaan nilai karakter dan prestasi belajar kimia peserta didik sebelum dan sesudah mengikuti pembelajaran dengan model pembelajaran *Project Based Learning* (PjBL), (2) ada perbedaan nilai karakter dan prestasi belajar kimia peserta didik sebelum dan sesudah mengikuti pembelajaran dengan model pembelajaran *Problem Based Learning* (PBL), (3) tidak ada perbedaan nilai karakter antara peserta didik yang mengikuti pembelajaran dengan model PjBL dengan peserta didik yang mengikuti pembelajaran dengan model PBL, (4) ada perbedaan prestasi belajar kimia antara peserta didik yang mengikuti pembelajaran dengan model PjBL dengan peserta didik yang mengikuti pembelajaran dengan model PBL, bila pengetahuan awal dikendalikan secara statistik.

Kata kunci: *Project Based Learning* (PjBL), *Problem Based Learning* (PBL), nilai karakter, prestasi belajar kimia.

COMPARATIVE EFFECTIVENESS OF LEARNING MODEL PROJECT BASED LEARNING (PjBL) AND PROBLEM BASED LEARNING (PBL) IN COLLOID SYSTEM ON CHARACTER VALUE AND CHEMISTRY LEARNING ACHIEVEMENT

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ABSTRACT

This research aimed to determine the increasing of character value and chemistry learning achievement of students of class XI MIA SMA Negeri 7 Purworejo by comparing the learning model of Project Based Learning (PjBL) and Problem Based Learning (PBL) on the material of colloid system.

The sample in this research consisted of 52 students divided into two classes. Class experiment 1 consisted of 26 students using learning model of Project Based Learning (PjBL) and the class experiment 2 consisted of 26 students using learning model of Problem Based Learning (PBL). The research instrument used to determine the improving of character value and chemistry learning achievement was in the form of questionnaire and chemistry learning achievement test for colloid system materials. The observation design was made repeatedly (pretest-posttest).

The results showed that (1) there was difference in the character value and chemistry learning achievements of students before and after teaching-learning using Project Based Learning (PjBL) learning model, (2) there was difference in the character value and chemistry learning achievements of students before and after teaching-learning using Problem Based Learning (PBL) learning model, (3) there was no difference in the character value between students following PjBL learning model with students following the PBL learning model, (4) there was difference in chemistry learning achievement between students following PjBL learning model with students following the PBL learning model, when initial chemistry knowledge was controlled statistically.

Keywords: Project Based Learning (PjBL), Problem Based Learning (PBL), character value, chemistry learning achievement.

PREFACE

Education has an important role in the formation of morals and values in society. Indonesia has made many efforts to continuously improve the quality of national education.

In the education system at the school known a very important part of that learning process, in which the interaction between teachers and students in an effort to improve the quality of moral and academic learners. School becomes a means which strongly supports the process of developing the character values to students. The aim of the school is to transform students into a better direction, in other words, teachers must be able to change the quality of student's moral and academic towards better [1].

Regarding to education, in addition to quality issues, one of the problems facing today is the crisis of the values of national character. To improve the quality of education and the character value of the nation, the government made a new policy by developing curriculum-2013. In curriculum-2013, the curriculum development focused on competencies and character formation of students [2].

Constructivist-based learning model is one alternative learning models that are suitable to used in chemical subjects appropriate to curriculum-2013 because constructivist-based learning model emphasizes the establishment of the knowledge of the learning experience. Just having knowledge and information is not enough to be successful in the workplace (and in personal life) learners should be able to solve the problem and give the right decision [3].

Project Based Learning (PjBL) and Problem Based Learning (PBL) are learning models that embraces constructivist theory. Project Based Learning (PjBL) is an instructional model that involves students actively in designing the learning objectives to produce a product or a real project. The projects created by students to encourage a wide range of capabilities, not just knowledge or technical issues, but also practical skills such as addressing information that is incomplete or inaccurate, determine the destination itself, and teamwork [4]. Problem Based Learning (PBL) is a model of learning that is based on the paradigm of constructivism, which is oriented to the learning process of students (student-centered learning). Problem Based Learning (PBL) focuses on the presentation of a problem (real or simulated) to the students, then students were asked to find a solution through a series of research and investigation based on theories, concepts, principles he learned from a variety of disciplines (multiple

perspective)[5]. Both Project Based Learning (PjBL) and Problem Based Learning (PBL), they become relevant learning model to be applied in learning chemistry that used curriculum-2013 and this model is able to improve the learning achievement and character value significantly especially in colloid system material.

Colloid system is one of the subjects in chemistry that study about mixture of substances that can not be mixed [6]. In this case, there is a concept that needs to be understood in detail by the students, including the applications in daily life, so students needs to explore their knowledge from their experience. By learning from experience, students can gain new knowledge, able to apply their knowledge to the real life, and can obtain a character-education from the learning process.

Learning achievement as a proof of the success of learning or the ability of students to undertake learning activities in accordance with the weight achieves [7].

Character is the personality formed by the internalization of various virtues that is believed and used as the basis for perspective, think, behave and act [8].

Project Based Learning (PjBL) and Problem Based Learning (PBL) can improve the learning achievement significantly. Project Based Learning can improve the learning achievement on introduction of economic development course of students in management department at the faculty of economics Unimed [9]. Problem Based Learning also can improve the learning achievement of students in general physics 1 course [10]. This research show that using Problem Based Learning model on the material of temperature and heat was significantly more effective in improving mastery of concepts.

Based on this research, researchers are encouraged to conduct research to compare the effectiveness of learning model Project Based Learning and Problem Based Learning on colloid system materials. Researcher assumed that Project Based Learning and Problem Based Learning can improve learning achievement in the subjects of chemistry, especially in the matter of colloid systems.

On the contrary to some of the research mentioned above, in this research in addition to comparing the effectiveness of the learning model Project Based Learning and Problem Based Learning on the results of learning achievement, this research also examines the effectiveness of both the learning model related to its influence on the improvement of student's character value. The research aims to determine the increasing of character value

and chemistry learning achievement of students of class XI MIA SMA Negeri 7 Purworejo by comparing the learning model Project Based Learning and Problem Based Learning on the material of colloid system.

RESEARCH METHOD

This research is an experimental research with two factors-two samples design and two factors with repeated observations with one covariable. Two factors-two sample; two factors here are Project Based Learning and Problem Based Learning and two samples here are experimental class 1 who used Project Based Learning and experimental class 2 who used Problem Based Learning. Two factors with repeated observations is chemistry learning achievement and character value using pretest-posttest design. One covariable were statistically controlled are initial knowledge of students in colloid systems which got from pretest.

The independent variable in this research are learning model of Project Based Learning and Problem Based Learning, the dependent variable are chemistry learning achievement and character value, the controlled variable is initial knowledge of students in colloid systems which got from pretest.

The population of this research is student of class XI MIA SMA Negeri 7 Purworejo and the sample in this research consist of 52 students divided into two classes. Class experiment 1 consists of 26 students who apply learning model Project Based Learning (PjBL) and the class experiment 2 consist of 26 students who apply learning model Problem Based Learning (PBL).

The research instrument that is used to determine the increasing of character value and chemistry learning achievement is in a form of questionnaire and chemistry learning achievement test for colloid system materials. The observation design were made repeatedly (pretest-posttest).

This research use one way covariance analysis (anacova) for the analysis data of chemistry learning achievement, initial knowledge of students in colloid systems act as controlled variable. Test of hypothesis requirements consist of homogenity test, normality test, anacova, independent t-test, and paired sample t-test.

RESULT AND DISCUSSION

This research was conducted in SMA N 7 Purworejo. This research use two classes, class experimental 1 and class experimental 2. Before testing the hypothesis, first should do is prerequisite

test, include homogenity and normality test. From the prerequisite test showed both samples come from homogeneous population and have normal distribution.

To determine whether there is difference in character value and chemistry learning achievement before and after using PjBL model is used paired sample t-test and the result is on significance level α=95% getting value of Sig.(2-tailed)= 0.000 (Sig <0.05) in both of character value and chemistry learning achievement before and after using PjBL learning model. It means there's difference significantly on both character value and chemistry learning achievement. While to determine whether there is difference in character value between PjBL class and PBL class, because on significance level α=95% it shows that Sig. value= 0.479 (sig>0.05) which means there's no difference statistically.

To determine whether there is difference in chemistry learning achievement is used anacova and on significance level α=95% the value of Sig. is 0.000 (Sig.< 0.05) and it means there's difference in chemistry learning achievement between students who use PjBL learning model and who use PBL learning model. Mathematically, the PjBL learning models is more effective than PBL learning model. Because the average character value and chemistry learning achievement before and after using PBL model is used paired sample t-test and the result is on significance level α=95% getting value of Sig.(2-tailed) =0.000 (Sig <0.05) in both of character value and chemistry learning achievement before and after using PBL learning model. It means there's also difference significantly on both character value and chemistry learning achievement.

To determine whether there is difference in character value between class experiment 1 and 2 which used PjBL and PBL learning model is used independent sample t test and from the average of gainskor the result is there is no difference of chemistry learning achievement on PjBL class is 87.50 and PBL class has average of chemistry learning achievement is 80.96.

CONCLUSSION

The results shows that:

1) There was difference in the character value and chemistry learning achievements of students before and after teaching-learning using Project Based Learning (PjBL) learning model.
2) There was difference in the character value and chemistry learning achievements of students before and after teaching-learning using Problem Based Learning (PBL) learning model

3) There was no difference in the character value between students following PjBL learning model with students following the PBL learning model.

4) There was difference in chemistry learning achievement between students following PjBL learning model with students following the PBL learning model, when initial chemistry knowledge was controlled statistically.

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Artikel ini telah disetujui untuk diterbitkan oleh Pembimbing pada tanggal 18 Desember 2015

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