Project Based Learning Multi Life Skill for Collaborative Skills and Technological Skills of Senior High School Students

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Abstract. This work aims to determine the effect of Project Based Learning containing Multi Life-Skills on collaborative and technology skills of senior high school (SMA) students, especially on thestatic fluid subject. The research design was aquasi-experiment using Posttest-Only Control Design. This work was conducted in SMA Negeri 1 Bae Kudus, with the population is all students of class X, while the sample is students of class X MIA 2 as an experimental class and X MIA 3 as a control class. The data were obtained by observation, test, and documentation. The results showed this model significantly affects the collaborative and technology skills of students of SMA 1 Bae Kudus, where the average result of collaborative and technology skills for the experimental class is higher than that of the control class. This is also supported by the remark of the post-test experimental class is higher than that of the control class.

1. Introduction

The development of information technology such as the Internet very rapidly and expanded to parts of the world has been used by many countries, institutions, and experts for various purposes including for education. The learning approach uses to explore knowledge, experience and synthesize[1]. The Internet is used as learning media in the process of teaching and learning activities in the classroom. Use of the internet can broaden the students to be more sensitive to the use of the internet as a medium to increase creativity and inspiration.

The times will change human needs as well as education although the essence of education itself has not changed, but the stock of knowledge in a person must be more complex. In the current era of cognitive abilities assumption, everyone is equal. Therefore, one must have a greater ability to become a superior human. There are three core capabilities that students need to have associated with 21st-century skills such as knowledge, meta-knowledge, and humanistic knowledge. The duration of intervention was more cost-effective to reduce the number of sessions in the intervention trajectory [2].

21st-century skills want the current knowledge oriented learning paradigm projects, problems, investigation, discovery, and creation. These activities provide opportunities for students to improve learning capabilities in the areas of cognitive, affective, and psycho motor. This affects the development of emotional intelligence, spiritual, and social students. Skills obtained in the process of learning physics in the classroom is still low. Skills that can be directly used in the world of work has

not been able to be integrated into the learning process in the classroom. The demands of organizing the learning process consist of theory and practice, capable of the only limited theory held while the practice of only one to two times in one semester. One effort to complement and augment the skills can be given an alternative that is to equip skills through project activities. The project can be done by the students in the learning process and the outside class hours.

Related skills needed to cope with change in the century two-one as well as the experts noted the need for mastery of skills. Skills of learning and innovation consist of critical thinking and problem solving, communication and collaboration, creativity and innovation. Skill digital literacy includes information literacy, media literacy, literacy information and communication technology. Skills career and life skill consist of flexibility and adaptability, initiative and self-regulation, social interaction and cross-cultural, productivity and accountability, leadership and accountability. Empirical evidence on the impact of instruction on the development and enhancement of critical thinking skills[3]. One model of learning that emphasizes collaboration skills and technological skills of students is a project-based learning model. This learning model allows students to develop their creativity in designing and creating a project that can be used to overcome the problems. All studentswill need opportunities to learn from high-quality curriculum materials where they engage in science practices[4].The projectbased learning model is a model of learning centered on student activity, student teachers learn together. During to do the project, students can train and develop their communication skills skills of observing, using tools and materials, interpret, plan projects, applying the concepts, ask questions and communicate well through technology.

The project-based learning model students will work collaboratively. Students express a problem as a challenge or a question that must be answered and manage their own time to complete the project. Based on this background, this study will use project based learning model that will be studied in senior high school. The study was conducted to determine the effect of project-based learning model multi-life skill learning to collaborative skills and technology skills of students on the topic of static fluid.

2. Methods

This research conducted in SMAN 1 Bae Kudus, the population of all grade X MIA in SMA 1 Bae Kudus in the academic year 2015/2016. The sample in this research is the students of grade X MIA 2 as an experimental group and X MIA 3 as a control group. The sampling technique is cluster random sampling. In this study using Quasi-Experimental Design with the form Posttest-Only Control Design [5].Methods of data collection in this study is the test, observation, and documentation. Analysis of data from student test consists of two phases initial and final stages. The homogeneity test using Barlett test [6]. The data analyze using the Kolmogorov-Smirnov normality test, t-test and correlation test.

3. Results And Discussion

The initial data used in the analysis of form replay remark elasticity of grade XMIA2 and XMIA3. The sample is homogeneous used Barlett test. Table 1 a calculation for homogeneity test.

Table 1. Normality test, homogeneity test for technology skill and collaborative skill

Multi Lifeskill	**Group**	***N***	***Mean***	***P-value***	**Description**	***P-value***	**Description**	**Uji t**
Collaborative skill	Experiment	32	89.53	0.805	Homogen	0.589	Normal	0.000
	Control	32	68.86			0.148	Normal	
Technology Skill	Experiment	32	89.45	0.801	Homogen	0.512	Normal	0.000
	Control	32	57.96			0.167	Normal	

Table 1 shows that the probability value homogeneity test of grade XMIA2 and grade XMIA3 is 0.805. If probability value of homogeneity test larger than 0.05. This means that the ability of the two grade is homogeny as the same for initial conditions grade. Normality test from final data used Kolmogorov-Smirnov test. The probability value grade XMIA2 is 0.589. The probability value grade XMIA3 is 0.148. The probability value of normality test more than 0.05. This means that the data is normal distributed collaborative skills. The probability remark grade XMIA2 is 0.512 and grade XMIA3 is 0.167. The probability value of normality test larger than 0.05. This means that the data is normally distributed technology skills. Analyze data using at-test to determine which grade higher collaborative skill and technological skill.

The probability value t-test both groupswere 0,000. The probability value collaborative skills t test was 0.000 larger than 0.05. This means that Ho rejected, collaborative skills experimental group XMIA2 were treated using project based multilineskill higher than the control group XMIA3 in the implementation using project-based learning.Final data analysis using t-tests were used to determine which grade have higher technology skills. The calculation of the value t-test technology skills in Table 1.

The probability value t-test of technology skill was 0.000 higher than 0.05. This means that Ho rejected, the value of technology skills experimental group XMIA2 were treated using project based multilineskill is higher than the control group X MIA 3 that the implementation using project-based learning model.In the analysis of data using correlation test is used to determine the significance of the relationship project based learning multi-life skill with collaborative skills and technology skills of students. The following calculations correlation project based learning multi-life skill with collaborative skills and technology skills. Table 2 show R-square between collaborative skill and technology skill.

Table 2. Correlation test for project-based learning multi life skill, technology skill, and collaborative skill

Group	Aspect	Mean	R-Square	P-Value
Experiment	PjBL Multilife skill	86.31	0.431	0.000
	Collaborative skill	89.53		
	PjBL Multilife skill	86.31	0.173	0.018
	Technology skill	89.45		
	Collaborative skill	89.53	0.202	0.010
	Technology skill	89.45		
Control	PjBL	69.78	0.173	0.027
	Collaborative skill	68.86		
	PjBL	69.78	0.139	0.036
	Technology skill	59.96		
	Collaborative skill	68.86	0.057	0.187
	Technology skill	57.96		

Table 2 R-square indicates how large a percentage of the influence of project based multi life skill against collaborative skill 43.1%. Probability value informs the significance level of project-based learning multi life skill against collaborative skill, hence 0,000 / 2 = 0.000 with 0.000smaller than 0.05. There is a significant influence of project based multi life skill against collaborative skill. R-square indicates how large a percentage of the influence of project-based learning multi-life skill model against technology skill that is 17.3%. Probability value informs the significance level of project-based learning multi-life skill model for technology skill, hence 0,000 / 2 = 0.000 with 0.000 smaller than 0.05. There is a significant influence of project-based learning multi-life skill model against technologyskill.

R-square indicates thepercentage of influence collaborative skill and technology skill against that is 20.2%. Probability value collaborative skill inform significance level of skill against technology skill, hence 0,010 / 2 = 0.005 with 0.005 smaller than 0.05. There is a significant relationship between collaborative skill and technology skill. Analysis of data using correlation test is used to determine the significance of the relationship project based learning with collaborative skills and technology skills of students. The following calculations correlation of project-based learning with collaborative skill and technology skill. R-square indicates how large a percentage of the influence of project based multi-life skill against skill collaborative is 17.3%. Probability value informs the significance level of project-based learning on collaborative skills, hence 0,027 / 2 = 0.0135 with 0.0135 smaller than 0.05. A significant difference between the project based learning and the collaborative skills.

R-square indicates how large a percentage of the influence of project-based learning to technology skills is 13.9%. Probability value informs the significance level of project-based learning on collaborative skills, hence 0.036/ 2 = 0.018 with 0.018 <0.05. A significant difference between the project based learning and technology skills. R-square indicates thepercentage of influence collaborative skill and technology skill against is 5.7%. Probability value collaborative skill inform significance level of technology skills, then 0.187 / 2 = 0.005 where 0.0935 smaller than 0.05. There is a significant difference between collaborative skill and technology skill.

At the time of the learning takes place is treated with an experimental group using project-based learning model of multi-life skill. In the project-based learning multi-life skill model students are requiredthe skills of rational thinking that are finding its own information about the projects to be undertaken, then from the information that has been obtained before students have to take the decision to determine the tools to be created, the students are required academic skills that student. Rational thinking skill must develop for performance and lifeskill of thestudent. The shift in science education toward deeper, more integrated learning of domain content and scientific practices requires that teachers steer clear of strategies that promote the steady accumulation of more superficial knowledge and capabilities [7]. If a person has the ability and knowledge of the complex, the ability to think is relevant to high-level thinking skills. The need for early intervention, the bulk of current empirical is focused on single component, individual and small groups interventions[8].

Create a tool that has been agreed upon by each group. In groups of students must have social skills which should be able to cooperate with other group members and after the appliance has been so students must present the work steps in front of the group.Argumentation in scientific activity supporting students to contest both what the know and their means of knowing, building more carefully from students resources and attending to the development [9]. Also, students have the technological prowess to explore their work. Based on the discussion of these results, collaborative skills and technology skills group students experiment by project based learning multi-life skill model better than project-based learning model. The correlation between the project based learning multi-life skill with collaborative skills and technology skills significantly more than project-based learning model.

The results show the collaborative skills significant influence students technology skills when learning to use the project-based learning amulti-life skill.There is a link between the collaborative skills and technology skills of students and student learning outcomes using project-based learning multi-life skill model. The results of the study consist of three aspects such as affective aspect, cognitive aspect and psychomotor aspect [10]. Collaborative skills of students including the technology skill aspects of the psychomotor skills while including the aspect of affective aspect and student learning outcomes included on cognitive aspects [11]. Students are taught using project-based learning multi-life skill model turned out to have good learning outcomes as well. In the project-based learning multi life skills students are required to be able to find information themselves so that students' memories will be longer given the formula that has been acquired [12]. In addition to learning outcomes, the project-based learning multi-lifeskill is also more effective aspect if seen from the assessment process and product assessment has been done.

Studies conducted develop 21st-century skills regarding cooperation and technology capabilities using model project based learning in the subjects of English with web-based learning. Besides learning outcomes and attitudes of the students who have been educated with multiple bits of

intelligence project based learning amultiline skill is more successful than theproject-based learning model.

4. Conclusion

Based on the results of the discussion is concluded that project-based learning multi life skill affect the independence of students of SMA 1 Bae Kudus. It is the results of the analysis differences the average remark of the experimental group and control group using t-test, there is a difference collaborative skills and technology skills of students on the remark of the observation sheet the experimental group and control group applied project-based learning multi life skill with a group that implemented the project-based learning model. Correlation test to see the effects ties dependent variable and independent variables saw that the influence of the more significant collaborative skills and technology skills by using project-based learning amulti-life skill. The students' response to the project based learning model charged multi-life skill that students were more active and enthusiastic during the learning process compared to the project-based learningmodel.

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