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The Effect of Online Project Based Learning on Students' Character

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ABSTRACT: The Covid-19 pandemic that emerged in early 2020, has had a very significant impact on various sectors, including education. Each country shifts learning activities at various levels from face-to-face (offline) to online learning. Achieving competences according to the high school chemistry curriculum is quite difficult to do through online learning, especially for skills and attitudes competency aspects. Chemistry learning during pandemic tended to focus on attaining the knowledge aspect. It needs attention, lest during the pandemic, there will be a degradation of students' character. It is necessary to design chemistry learning that can facilitate the development of students' character. One of the efforts that can be done is implementing a variety of online learning models. Project based learning can be an alternative strategy to facilitate the development of students' character. It is necessary to conduct a study to determine the implementation strategy and impact of project based online learning, because it is not easy to apply the syntax in online learning. The purpose of this study was to investigate the effects of project based online learning on students' character. The study was a quasi-experimental, with posttest only design. The research population was students of class XI of a public high school in Sleman Regency. The research sample was determined by using purposive sampling technique. The data collection instrument was a questionnaire. The data analysis technique used the independent sample T-test. Based on the research data, it is concluded that there is no difference on students' character between the implementation of project based online learning and conventional online learning.

Keywords: online learning, project-based learning, prophetic character

INTRODUCTION

The Covid-19 pandemic that emerged in early 2020, has had a very significant impact on various sectors, including education. Education at all levels required to respond quickly assessing the impact of this pandemic. Each country shifts learning activities at various levels from face-to-face (offline) to online learning. Online learning certainly demands the readiness and ability of teachers, online learning tools, parental support, and readiness of the students. It is not a simple matter for teachers to conduct online learning, especially for teachers who are not previously used to even e-learning.

Achieving competences according to the high school chemistry curriculum is quite difficult to do through online learning, especially for the skills and attitudes competency aspects. Observations were done at six high schools show that during online learning, chemistry teachers only provide materials and assignments that were delivered via WhatsApp Group (WAG). Conventional online learning causes student bored, besides that it does not equip students with skills and attitudes. Online chemistry learning requires appropriate and easy learning strategies for students to do. Chemistry learning during pandemic tended to focus on attaining the knowledge aspect. It needs attention lest during the pandemic there is a moral degradation of students. It is necessary to design chemistry learning that can facilitate the development of students' character. Character development can be implemented into all subjects, including chemistry. Even chemistry has great opportunities to develop students' character.

Education in Indonesia functions to develop abilities and shape the character and civilization of a nation

with dignity in order to educate the nation life, purposes to develop the potential of students to become human beings who believe and fear into God Almighty, noble, healthy, knowledgeable, competent, creative, independent, and become a citizen who is democratic and responsible [1]. The character that needs to be developed in the learning process is a prophetic character. Prophetic character is a universal character, it is needed in any society to create civil society. Prophetic characters include fathanah, amanah, sidiq, tabligh. Amanah character is the basic foundation in human social relations [2]. Research showed that the prototype of amanah person is someone who has a positive character: trustworthy, responsible, honest and able to carry out the assigned task. In addition, amanah has good reliability and it is formed by three factors, namely integrity, carrying out duties, and virtue [2].

The moral degradation that occurs in society makes the implementation of character education becomes very important [3-5]. Character can be developed through learning [6]. Character does not form instantly. Changes of behavior as a result of learning requires conscious and active practice. One of the steps in planting character in students is internalizing the feelings of the characters. Efforts that teachers can do at this stage are to maximize learning strategies [3]. There are a variety of learning models that can be used to internalize the character of students. It is the task of educators to prepare learning that can develop students' character.

Project based learning (PjBL) can be an alternative to develop positive characters. PjBL is learning that facilitates students to construct and apply knowledge in a project product. PjBL is a learning model which developed from John Dewey's thoughts about learning by doing. PjBL is a learning model that makes projects as the core of activities. This model requires students to be active in constructing knowledge and producing real work. The problems raised in PjBL are serious, relevant, real, and complex problems. Global School Net reports the results of the Auto Desk Foundation's research on the characteristics of PjBL. The results of the study state that PjBL has the following characteristics: 1) students make decisions about a framework, 2) there are problems or challenges posed to students, 3) students design processes to determine solutions to problems or challenges proposed, 4) students are collaboratively responsible for accessing and managing information to solve problems, 5) the evaluation process is carried out continuously, 6) students periodically reflect on activities that have been carried out, 7) the final product of learning activities will be evaluated qualitatively, 8) the learning situation very tolerant of errors and changes [7].

The steps of learning (syntax) for PjBL, in general, include: 1) start with the essential question, learning begins by giving essential questions, questions must be able to lead on assignment. Questions must be real, complex, and relevant to student needs. 2) Design a plan for the project, students need to collect information related to the formulation of questions. From the information that has been obtained, students can make a project design. 3) Create a schedule, lecturers and students collaborate in preparing a schedule of activities in completing the project. In addition, at this stage, the teacher guides students if there are activities planned that are not according to the pons for choosing activities or project plans. 4) Monitor the students and the progress of the project, the teacher monitors and facilitates student activities in completing the project. 5) Assess the outcome, the assessment is carried out to measure the achievement of learning, plays a role in evaluating progress, and provides feedback on the level of understanding that has been achieved by students. The assessment of the outcome is an activity to analyze the products of the project that has been carried out, whether the resulting product can be used to answer the questions formulated at the beginning of the lesson. 6) Evaluate the experiences, at the end of the learning process, a reflection is done for the activities and results of the project that has been carried out. Students can express experiences in project completion. Teachers and students collaboratively evaluate the learning experience [8].

There have been many studies which conducted to study the effect of implementing PjBL. The implementation of PjBL has had a positive influence, these include the development of attitudes, self-concept, environmental-based learning habituation, academic achievement, understanding of contextual knowledge, interests and curiosity [9-11].

It is necessary to investigate the effects of project based online learning on students' character of amanah. The purpose of this study was to investigate the effects of project based online learning on students' character. Implementation of online PjBL requires a different strategy from offline PjBL, the entire PjBL syntax is done online. Students discuss to come up the solutions in a project with online tool support. All stages are recorded in an e-portfolio, the teacher reviews students' plans and interactions by email or chat [12]. Research conducted by Atef showed that online and offline PjBL results the positive student attitudes, but the effect of offline PjBL is better than online [13].

METHODS

This experimental research was carried out using the quasi-experimental design namely the post-test only with nonequivalent groups design. The study focused on comparing the scores of *amanah* between the control and the experimental class. Learning on colloid material and carried out online, PjBL was applied in the experimental class and the conventional learning was applied in the control class. The learning on control class, teacher only gave material and assignments. Learning in control and experimental class each were carried out in three meetings. The experimental design as explained in Table 1.

TABLE 1. Experimental Research Design

Class	Treatment	Final state
Experiment	X	Y
Control	-	Y

X: Learning chemistry using PjBL
Y: The experimental class and the control class were given a posttest

The research was conducted in one of the state senior high school in Sleman district on April-May 2020. The subject of the study were 64 students, divided into 32 students in the control class and 32 students in the experimental class. The data collection instrument was *amanah* character questionnaire which was developed from 4 indicators, namely commitment, discipline, responsibility, and professionalism [14]. Questionnaire consists of 30 statement items. The content validity of questionnaire was carried out by 2 validators and used the Gregory formula for the calculation, if content validity index> 0.7 then the instrument can be used. The result of the calculation of the content validity index of the questionnaire is 0.7714, so that the instrument is feasible to use. The hypotheses were tested by independent sample T-test since the data were normal and homogeneous.

RESULT AND DISCUSSION

The summary of data is shown in Table 2, the result of normality and homogeneity test are shown in Table 3. Data is normal and homogen, so that it can be followed by independent sample T-test. Hypothesis test results showed a significant value of 0. 524, more than 0.05, which means that there were not differences in scores of *amanah* between the experimental class and the control class.

TABLE 2. Summary of data

Class	Min	Max	Mean
Experimental	75	102	88.06
Control	76	1007	89.12

TABLE 3. Result of normality and homogeneity test

Class	Normality		Homogeneity	
	Sig.	**Conclusion**	***Sig.***	**Conclusion**
Experiment	0.408	Normal	0.482	Homogeneous
Control	0.337	Normal		

TABLE 4. Result of hypothesis test

Hypothesis test	Sig.	Conclusion	
Independent Sample T-Test	0.524	Ho received H_1 rejected	There is not a significant difference

Table 4 shows that there is no difference in the character of the student's *amanah* between the control class and the experimental class. Syntax PjBL can theoretically develop the character and achievements of student learning, because it facilitates students to learn by doing. Character *amanah* indicators, namely commitment, discipline, responsibility, and professionalism, should be developed through project learning. Because through projects, students are required to have commitment, discipline, responsibility, and professionalism in project completion. Unlike conventional learning where the teacher only uploads material and gives assignments, in PjBL students are required to discuss and collaborate. Discussions between students can foster character values [5].

Online implementation of PjBL will not be optimal without device support. This is a weakness in this research. Lesson plan developed following school policy, including minimizing the use of media in addition to WAG and JB Class. JB Class is a service which is created and centralized by the Yogyakarta Educational Technology Center. The JB Class is basically an adaptation of the conventional education system which is modified in electronic form by the internet based on the website. JB Class can be accessed by teachers, students, and parents. Teachers can use JB Class to upload material, create assignments, and view student's work results. The data collection process was carried out using several applications such as the WAG and the JB class as classrooms. The use of virtual face-to-face applications such as Zoom, Google Meet is minimal, because not all students have the supported devices and adequate networks.

Learning in the experimental class is carried out according to the PjBL syntax:

1. *Start with the essential question*

Learning began by giving essential questions, questions that can lead on assignment. Students are directed to the use of colloids in life. Students showed high interest when the teacher asked questions on the subject matter to be solved. Because the questions that were given are relevant to the needs of students in the real world. This stage aimed not only to direct students to the project to be worked on, but to generate interest in learning. This stage is important because the learning process will not be effective without the conscious effort and interest of the students. Briefing and generating interest can be effective when questions are real, weighty, and relevant to student needs. This stage was carried out through the WAG, teacher was delivering video and voice recordings. Students responded by chats.

2. *Design a plan for the project*

The teacher divided students into groups. Each group is composed of 5-6 students. The teacher monitored the WAG of each group. Students collected information related to the focus of the project, namely making posters about the nature, manufacture and the use of colloids. From the information obtained, students could make project designs.

3. *Create a schedule*

Teachers and students collaborated to compile a schedule of activities in completing the project. In addition, at this stage the teacher guided students if there are activities that were not planned according to the project.

4. *Monitor the students and the progress of the project*

The teacher monitored and facilitated students' activities in completing projects. Students collaborated and discussed actively through WAG. The entire project portfolio was uploaded to JB Class.

5. *Assess the outcome*

Assessment was carried out to measure learning achievement, play a role in evaluating progress, and provide feedback on the level of understanding that has been achieved by students. Each group presented the project that was carried out through the WAG by uploading a presentation video and the resulting product.

6. *Evaluate the experiences*.

At the end of the learning process, a reflection was carried out on the activities and results of the project that have been carried out. Students expressed experiences in project completion. Teachers and students collaboratively evaluated the learning experience.

Observations showed that the online application of PjBL was not running optimally, device and network limitations are the main problems. Collaboration, communication that ideally could run in real time became difficult to do. Student's responses during group discussions at WAG were often not fast. This led to collaboration and communication within the group was not optimal. Discussion becomes an important thing in project learning, through discussion the values of commitment, discipline, responsibility, and professionalism can be developed.

The results of the study need to be noticed by stakeholders. During a pandemic, if chemistry learning is only carried out by providing materials and assignments through WAG, it will certainly affect students' achievement in the aspects of knowledge, attitudes, and skills. However, to implement a variety of online learning models requires strategies and readiness from schools and students. Limitations of devices and networks are the main obstacles in online learning. Strategies that can be carried out in particular for the implementation of PjBL during the pandemic include holding blended learning and dividing groups according to zoning of student residences. Schools can perform scheduling so that students can take turns attending face to face at school. It can be a solution for students who have difficulty with devices and internet connection. Students can take turns attending school according to their respective groups on schedule. The hope is that misconceptions, student's incomprehension can be overcome by meeting the teacher. In addition, in the context of project, students' collaboration and communication will be more effective. However, if conditions do not allow students to attend school during a pandemic, group division arrangements may be an alternative solution. Teachers can consider zoning or the distance between students' houses for dividing the division of groups in PjBL. Students who are close together are grouped into one group. The hope is that students can discuss and complete projects face-to-face while still implementing the Covid-19 protocol.

CONCLUSION

Based on the analysis of study data and discussion that has been described, it can be concluded that there is no effect of project based online learning on students' character. There is no difference in the character of the student's amanah between the control class and the experimental class.

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