Implementation of Project-Based Learning Model to Improve Student Learning Activities and Outcomes During Pandemics

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Abstract—**The purpose of this study is to find out the increase in the learning and student learning outcomes during pandemics with the implementation of the Project-Based Learning (PBL) learning model. This research is classroom action research to solve problems in the classroom. Research is conducted in two cycles and each cycle is reflected on the actions given. Data collection techniques using observation sheets, study results tests, and documentation. Techniques for data analysis are with quantitative descriptive analysis techniques. The results showed that the implementation of learning using the Project-Based Learning learning model can increase the activeness of learning and learning outcomes of AKP students in the eyes of public sector accounting workshops. This can be seen from the results of student activity in cycle I by 75.35% increased to 85.77% in cycle II. Then the student learning results are seen from the average grade in cycle I of 78 with a percentage of completion of 74% and increased in cycle II class average to 83 with a completion percentage of 85%.**

Keywords—*Project-Based Learning (PBL), Learning Activities, Learning Outcomes*

I. INTRODUCTION

Workshop based education as one aspect of education has an important role in improving the quality of education, especially in producing quality human resources, namely people who can think critically, creatively, able to make decisions, and able to solve problems and, apply science in life for the welfare of mankind [1]. Learning activities must be able to empower students. a learning that not only requires learners to memorize facts and concepts but learning encourages students to be creative and active.

During the current pandemic, various methods are used to achieve the ultimate goal of learning taught by every lecturer. Lecturers always think hard even though online learning based on practice and workshops should be carried out properly. Public Sector Accounting Workshop course is one of the workshop courses in the Public Finance Accounting Program. Before the pandemic, usually, practicum workshop meetings were conducted by inviting practitioners from the government and industry. When the pandemic took place and there were restrictions gathered, the workshop lecture process was slightly hampered so that lecturers were looking for alternative learning methods that could be used for public sector accounting workshop courses. One of them is the application of learning methods that make students and learning controllers, not the dominance of lecturers. Such a method is necessary especially for theories that require practical work so that it is expected that students will find existing problems independently and be able to find a way to solve them. To realize such ideal learning, methods that can be applied include problem-based learning methods, inquiry-based learning, project/work-based learning and, work-based learning.

Project-based learning is part of the learning process that emphasizes problem-solving as a collaborative effort in a certain learning period [2]. [3] Defines project-based learning as a systematic learning method that engages learners in learning knowledge and skills through complex inquiries, authentic questions and, work and product design. In general, project-based learning goes through three stages, namely project planning, project implementation and, project evaluation. Planning activities include: identifying real problems, finding alternatives and formulating problem-solving strategies, and planning. The implementation phase includes mentoring students in completing tasks, conducting product testing (evaluation) and, presentations between groups. The evaluation phase includes assessment of processes and products which

include: project learning progress, actual processes of problem-solving, the progress of the team and individual performance, research notebooks and notes, and reflections. While product assessment includes work and presentations, as well as project reports.

Educators in the project-based learning models, serve as problem presenters, facilitators, help students solve problems and, become one of the learning resources of students. In addition, educators provide support, motivation and, encouragement that can increase the growth of student intellectuals. In this case, educators act as stimuli, mentors of student activities, and determinants of their learning direction. In addition, the development of problem-based learning models in force materials that affects the motion and shape of an object is very strategic, along with the implementation of KBK, so that educator creativity can be improved, and the availability of various facilities that have limited can be improved. And it is expected to increase student activities and learning outcomes in public sector accounting workshop courses.

In online learning activities, students are no longer only passive by waiting for material from lecturers, this is due to the role of a lecturer as a complete facilitator. As Robin &Frank points out in [4], that in online-based learning, teachers, lecturers, instructors become facilitators, guides, or even expert resource persons, and are no longer the only determinants for the student learning experience. When becoming a facilitator, it is certain that the duties of a lecturer will certainly. So that this project-based learning model is suitable to be applied to public sector accounting workshop courses. This course is a course that must be taken by students of the Public Sector Accounting Program of Bengkalis State Polytechnic which is useful to equip students with real knowledge of problems in Public Sector organizations. Students can do several projects according to the theme in the syllabus. The aim of this research is to apply this project-based learning model can make students more active, creative and can encourage students to increase courage in expressing opinions as well as the ability to work together in solving problems related to the material being studied, thus producing a product or work made by students themselves.

II. RELATED WORK

Research conducted by [5] entitled "Application of Problem Based Learning (PBL) Learning Model During the Covid 19 Pandemic In Improving Student Activity and Learning Outcomes in Creative And Entrepreneurial Product Subjects". The purpose of this research is to find out the increasing activeness of learning and learning outcomes of grade XII students in the subjects of Creative Products and Entrepreneurship at SMK Hidayatus Sholihin with the implementation of problem-based learning (PBL) model. This research is classroom action research to solve problems in the classroom. The research was conducted in three cycles and each cycle was reflected on the actions given. The results showed that the implementation of learning using a problem-based learning model can improve the activeness of learning and learning outcomes of grade XII students in PKK subjects at SMK Hidayatus Sholihin. This can be seen from the activeness of students from cycle I by 62.01% increased to 76.30% in cycle II and increased in cycle III by 80.19%. The results of learning students' knowledge can be seen from the average grade score in cycle I of 76 with a percentage of completion of 50% and increased in cycle II class average to 80 with a percentage of completion of 64% and increased in cycle III class average to 84 with a completion percentage of 86%.

Furthermore, research conducted by [6] entitled "Application of Project-Based Online Learning Model to Increase a Confidence of Students of Grade I Sd Negeri Rejodani". This study aims to increase the confidence of grade I learners in online learning. This research is a class action research (PTK) with research subjects are all students of grade I SD Negeri Rejodani Ngaglik semester I year 2020/2021 which amounts to 28 people, consisting of 17 female students and 11 male students. Each research cycle consists of stages, namely planning, execution of actions, observations, and reflections. These stages take place over and over until the research objectives are achieved. The analysis technique used is the qualitative data technique of the interactive model. The results showed that in cycle I the confidence level of learners was 57% and in cycle II the confidence level of learners had reached the target of 88%. The results in cycle II have reached the success criteria so that the action is stopped on that cycle.

The same research was also conducted by [7] entitled "Application of Project Based Learning Model to Improve Activeness of Learning of Grade IV Students in Madrasah Ibtidaiyah Negeri 4 Muaro Jambi". The purpose of this study was to find out how to increase the activeness of students in thematic learning of grade IV in madrasah ibtidaiyah negeri 4 muaro jambi with the application of project-based learning model. This study is Classroom Action Research. The subject of this study was a grade IV student at Madrasah Ibtidaiyah Negeri 4 Muaro Jambi, while the research object was the application of Thematic learning using the Project Based Learning

learning model, improving the activeness of student learning on the Theme of My Residential Area. The results showed that the application of project-based learning models can improve the activeness of students' learning in the learning process.

[9] In his research explained about A good an appropriate method and strategy in learning is needed to create an active study and learning science activity. That it will hope to increase the result of students learning. Based on the first observation in fourth grade of SDN Balas Klumprik I/434 Surabaya, shows that the grade of student activities in learning and teaching activity is still low. It is only about 10% students that can give some questions, give suggestion or idea or may be give a reaction and protest to an idea. For those, it is necessary to raise the result of student ability, and one of them is through method of study based on the problem. The purpose of this research is for knowing the raising of activity and the student result in learning and teaching science through study that based on the problm process. This class action of research was done in two cycles, that each of those cycles have plan stage, action of implementation, observation and reflection or evaluation. The result of the data in this research includes : Teacher's ability to learning manage that taken from observation sheet, students activities, and a group, and the result of student learning includes : cognitive aspect, affective and psycomotoric that taken from question or questioner in the end of cycles learning in every last meeting. Based on this research, the activity of teacher's learning in cycles I is 68,8% and has increase 93,8%. In cycles II student activity in cycle I, the best students are only 68% and has increase 82%, in cycle II. Students activity in cycle I is 50% and has increase 90% in cycle II. And the result of students learning on 4th grade in SDN Balas Klumprik I/434 Surabaya after learning based on problem applied, they have increasing at 62,7% in cycle I and 85,3% in cycles II. So the conclusion is the raising of significant activities and the result of students learning in science through study and learning based on the problem.

One of the indicators of the learning process achieved or not is by looking at the learning outcomes achieved by students. Learning is designed to teach students, meaning students are placed as subjects of learning. In other words, learning is more oriented to the activeness of students to obtain learning outcomes, one of which is knowledge or experience. According to [8] Learning outcomes are achievements achieved after students complete the lesson materials. According to [9] Learning outcomes are changes in behavior as a result of the learning process. This change is in the form of knowledge, understanding,

skills, and attitudes that usually cover cognitive, aspectative, and psychomotor aspects.

III. METHODS

This study uses Class Action Research (PTK). Class action research is a form of reflective study by actors of actions carried out to improve the rational stability of their actions in carrying out tasks, deepen understanding of the actions taken, and improve the conditions under which the practice of learning is carried out [10]. This action research procedure is a cycle covering 4 stages, planning, Action, Observing, and reflection. Figure 1 below illustrates the steps of the Class Action research model:
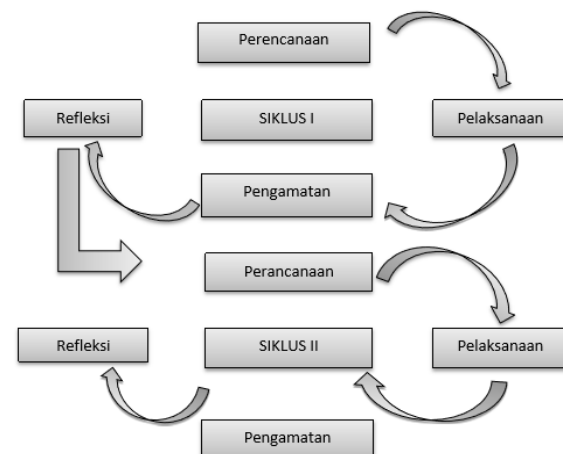

Figure 1. Class Action Research Model According to Kemmis &Mc Taggart

1). Planning

The planning phase of this study was carried out in the following ways:
a. Set a research time with the research subject.
b. Create a learning implementation plan using the Project based learning model.
c. Prepare the necessary learning tools and materials during the learning process.
d. Prepare an instrument sheet observation test of the student's ability to solve problems made based on indicators of students' ability to solve problems.

2). Implementation or action (Acting)

The stages of implementation in this learning include:

a. Preliminary stage
This stage is done by opening lectures with opening activities, conveying learning goals and materials that will be taught to students.

b. Learning Stage
This stage is done by providing basic questions that can give students assignments in doing activities, in addition to designing projects in case, preparing activity schedules, monitoring students in project making and testing student work.

c. Closing Activities
At this stage the lecturer concludes the learning materials that have been delivered, gives assignments to students and closes lectures.

3). Observation (Observing)

Observation is a technique used to observe up close in an effort to find and dig data through direct and in-depth observation of the subject and object studied. Researchers conducted a pre-prepared observation. Observations are made that observe the thematic learning process using a project-based learning model with the aim to find out the activeness of students in the learning process.

4). Reflection

Reflection is an activity to re-express what has happened [11].

a. Cycle I
Researchers collaborate with lecturers to discuss the learning process that has been implemented based on the observation sheet provided. Success in the first cycle will be used as a reference in carrying out the next cycle.

b. Cycle II
While the shortcomings in the first cycle will be discussed with the lecturer to decide how to determine improvements in the next cycle. Researchers will take action on the second cycle carefully and perform deficiencies that exist in cycle one. So that researchers can determine learning improvements as material to structure actions in the next cycle. If the given action can improve the ability of students in solving problems according to the indicators that have been determined, it can be stopped. But if the research indicator has not been reached, the research continues to the next cycle.

IV. DESIGN RESULT

Before carrying out the action, it is necessary to do a pre-cycle one of them by using pre-test to know the understanding of students in the public

sector accounting workshop courses. The following are the pre-test results of students can be seen in the table below.

Table 1. Student Pre Test Results

Pre Test Value Results	Class A	Class B	Average Total
Lowest Value	45	50	48
Highest Score	80	80	80
Number of students completed pre test	14	17	31
Number of students has not completed pre test	12	11	23
Average	64	62	63
Percentage of completion	53%	60%	57%

4.1 Cycle I, Observation of student activities during the implementation of the Project Based Learning model.

Observations are carried out to collect data and to measure student activity in the learning process. In the implementation of this observation is a lecturer in public sector accounting workshop. The observations are recorded in the prepared observation sheet. The observations of AKP students' activeness in cycle I are as follows:

Table 2.
Student Activity Observation Results

No.	Indicators or aspects assessed	Cycle I
1.	Student activity when following the teaching and learning process online from filling attendance	81,07
2.	Students ask questions in the comments field if students have difficulty in understanding explanations from lecturers and practitioners	81,01
3.	Students collect assignments on time	81,57
4.	Ask questions during or after the teaching and learning process activities take place	71,99
5.	Answer the presenter's question when someone asks	82,08
6.	Expressing an opinion after the learning process is carried out	68,68
7.	Writing workshop learning results on activity reports	82,07
	Average	**78,35**

Based on the table above shows that at the meeting cycle I student activity of 78.35%, this shows that the indicator of success in learning achievement has exceeded the target of 75. So that the above results can be determined that the cycle I activeness of

students has achieved an increase in indicators of success. It can be seen during the learning process that with the PBL learning model has been well received by students. Students pay more attention when the lecturer explains, then during the learning process, ask more questions, as well as answer more questions during online learning.

The process of retrieving the value of student learning results is carried out at the meeting cycle I. This test is used to measure student learning outcomes against material understanding at Public Sector Accounting workshop activities. The selected form of test is to verbally recite the contents of the material that has been conveyed by lecturers and practitioners. There are assignments given in the form of cases sent directly in the google class room and through the class WAG. Data on student learning outcomes in cycle I can be seen in the following table:

Table 3. Student Learning Outcomes Cycle I

Student Learning Outcomes Cycle I	Class A	Class B	Average Total
Lowest Value	70	75	73
Highest Score	83	85	84
Number of students completed	19	21	40
Number of students has not completed	7	7	14
Average	77	80	78
Percentage of completion	**73%**	**75%**	**74%**

Based on the table above, it can be explained that the results of AKP students studying in the first cycle showed the average post test in cycle I was 78 out of 54 students who took the test. The lowest value is 73 and the highest is 84. For the percentage of completion of 74%. A total of 40 students fall into the category of complete or more than 75. While 14 students fall into the category of incomplete or less than 75.

4.2   Cycle II, Observation of student activities during the implementation of the Project Based Learning model.

Observations are carried out to collect data and to measure student activity in the learning process. In the implementation of this observation is a lecturer in public sector accounting workshop. The observations are recorded in the prepared observation sheet. The observations of AKP students' activeness in cycle II are as follows:

Table 4. Student Activity Observation Results

No.	Indicators or aspects assessed	Cycle II
1.	Student activity when following the teaching and learning process online from filling attendance	89,89
2.	Students ask questions in the comments field if students have difficulty in understanding explanations from lecturers and practitioners	84,07
3.	Students collect assignments on time	88,93
4.	Ask questions during or after the teaching and learning process activities take place	81,15
5.	Answer the presenter's question when someone asks	86,08
6.	Expressing an opinion after the learning process is carried out	82,22
7.	Writing workshop learning results on activity reports	88,07
	Average	**85,77**

Based on the table above shows that at the meeting cycle I student activity of 78.35%. Then at the meeting cycle II by 85.77%. The increase occurred at the second meeting by 7.42%. Based on the above results can be determined that the cycle II activeness of students has achieved an increase in indicators of success. It can be seen during the learning process that with pbl learning model has been well received by students. Students pay more attention when the lecturer explains during the learning, more questions asked during the learning, more answer questions during online imprisonment.

The process of retrieving the value of post-test learning results is carried out in cycle II. This post test is used to measure students' learning outcomes against material understanding in Public Sector Accounting workshop courses. The form of post test used is to provide oral tests with the creation of videos sent through the class WAG as well as assignments submitted in the google class room. Data on student learning outcomes in the second cycle can be seen in the following table:

Table 5. Student Learning Outcomes Cycle II

Student Learning Outcomes Cycle I	Class A	Class B	Average Total
Lowest Value	75	77	76
Highest Score	89	90	89
Number of students completed	22	24	46
Number of students has not completed	4	4	8
Average	82	84	83

Percentage of completion	**84%**	**86%**	**85%**

Based on the table above can be explained that the results of studying AKP students in cycle II showed an average post test that is 83 out of 54 students who took the test with the lowest score of 76 and the highest score of 89 with a graduation percentage of 85%. A total of 46 students fall into the category of complete or more than 75. While 8 students fall into the category of incomplete or less than 75.

4.3. Increased Student Activity in Cycles

Based on observations made by observers and data analysis shows that there is an increase in student learning activity in every aspect from cycle 1 to cycle II. For the results of improved student activity in cycles I and II can be shown in the following table:

Table 6. Results of Increased Student Activity in The Cycle

No.	Indicators	Cycle I	Cycle II
1.	Student activity when following the teaching and learning process online from filling attendance	81,07	89,89
2.	Students ask questions in the comments field if students have difficulty in understanding explanations from lecturers and practitioners	81,01	84,07
3.	Students collect assignments on time	81,57	88,93
4.	Ask questions during or after the teaching and learning process activities take place	71,99	81,15
5.	Answer the presenter's question when someone asks	82,08	86,08
6.	Expressing an opinion after the learning process is carried out	68,68	82,22
7.	Writing workshop learning results on activity reports	82,07	88,07
	Average	**78,35**	**85,77**

From the table above, it can be explained that in the aspect of student activity, observation assessment criteria are measured through seven indicators, namely: (a) Student activity when following the teaching and learning process online from absenteeism, (b) Students ask questions in the comments field if students have difficulty in understanding explanations from lecturers and practitioners, (c) Students collect assignments on time , (d) Asking questions during or after the teaching and learning process activities take place, (e) Answering the presenter's questions when someone asks, (f) Expressing an opinion after the learning process, (g) Writing the results of the workshop learning on the activity report. Based on the observation of the activeness of learning cycle I shows an average percentage of student activity of 78.35% which indicates the achievement of the criteria for successful action. The learning process carried out in cycle II that runs better, this is an effort to make improvements from the results of reflection in the first cycle. The average increase in student learning activity obtained in cycle II was 85.77%.

Based on the table above about the results of activeness of AKP students in cycle I and Cycle II, can be described diagram as follows:
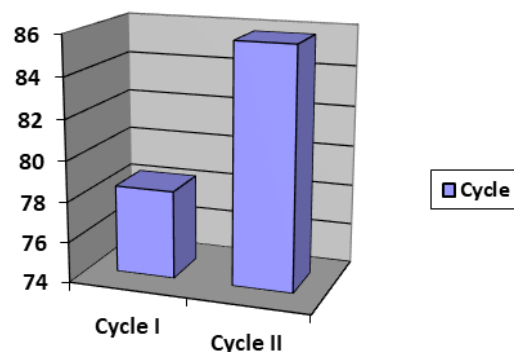

Figure 2. Sudent Activity Results in Cycle I & Cycle II

Based on the activeness graph of AKP students in the Public Sector Accounting Workshop courses in cycles I and II, it can be concluded that there was an increase of 7.42%. Here it can be said that the activeness obtained by each indicator has achieved the expected success criteria of students in cycle II has begun to adapt to the learning model used. The activeness of students can be seen during the learning process, namely when the practitioner lecturer fills in the learning materials, many students respond boldly to ask questions related to the material and other important things, such as the title of the study. In addition, students are also used to discussing and exchanging information with members of their group. In completing the assignment given by the lecturer, each student in the group is enthusiastic in doing it. Thus, it can be concluded that this PBL learning model can increase the activeness of AKP students' learning.

Based on the results of the research shows that the application of the Learning Model Project Based Learning in AKP students can improve the learning outcomes as well as the knowledge of students in the course of Public Sector Accounting Workshop. This can be seen by the improvement of student learning outcomes through pre-cycle learning results tests, cycle I and cycle II. Details of student learning outcomes can be seen in the following:

Table 7. Student Learning Outcomes through Pre Cycle, Cycle I &Cycle II

Student Learning Outcomes Cycle I	Pre Cycle	Class A	Class B
Lowest Value	48	73	76
Highest Score	80	84	89
Number of students completed	31	40	46
Number of students has not completed	23	14	8
Average	63	78	83
Percentage of completion	**57%**	**74%**	**85%**

Based on the table above, in the pre-cycle before the post test results there were 23 students who had not completed, 31 students who completed with the highest score of 80 and the lowest score of 48. In cycle I there are 14 students who have not completed, 40 students have completed with the highest score of 84 and the lowest score of 73. While the second cycle of student learning outcomes towards learning becomes better where there are 8 students who have not completed, 46 students have completed with the highest score of 89 and the lowest score of 76. Apart from the lack of optimal percentage of student graduation in cycle I and cycle II when compared to the initial value (pre-cycle) then the percentage of completion in cycle I and II using the PBL learning model of each cycle shows an improvement in student learning outcomes and in accordance with the indicators of success in this study is 50% in the first cycle of 74% in the second cycle 85%. Thus, it can be concluded that the PBL learning model can improve the learning outcomes of AKP students. The data of the implementation of the action has reached a good indicator so that the researcher decides not to proceed to the next cycle.

From the table above on the results of learning AKP students in the Pre cycle, cycle I and Cycle II, can be described diagram as follows:
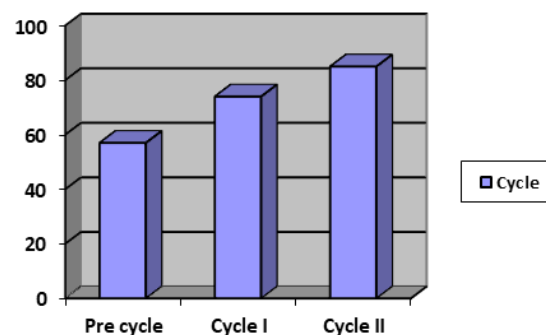

Figure 3. Student Learning Outcomes in Pre Cycle, Cycle I &Cycle II

From the diagram above as a whole, student learning outcomes improved from pre-cycle 57%, cycle I by 78.35% to 85.77% in cycle II. Students are able to carry out all stages of the project well in cycle II. This is supported by [2] which explains that project-based learning is a good discussion opportunity for students, stimulates students' direct discovery of real-world problems, gives learners pleasure in learning and can be an effective teaching strategy. Students become more active in working on teaching materials because they can discuss problems and solve them together in groups. Thus, students become more happy and interested in the implementation of this project-based learning model so that students respond positively to learning activities by implementing a project-based learning model.

V. CONCLUSIONS

Based on the results of research and discussion, class action research in public sector accounting workshop courses in Public Finance Accounting program can be concluded as follows:
1. The application of Project Based Learning learning model can increase the active learning of AKP students in the Public Finance Accounting Program in public sector accounting workshop courses. This is based on observational data from all indicators observed in cycle I with a percentage of student learning activity of 78.35% and an increase in cycle II of 85.77%.
2. The application of Project Based Learning learning model can improve the learning outcomes of AKP students in the Public Finance Accounting Study Program in the Public Sector Accounting Workshop course. This can be explained that the average student learning

outcome in the pre-cycle is 63 with a percentage of completion of 57%. In the first cycle, the average student study outcome was 78 with a completion percentage of 74%. Furthermore, in the second cycle, the average student learning outcome is 83 with a completion percentage of 85%.

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