



# Analysis of Teacher Strategies to Develop Students' Collaboration and Communication Skills Through Project-Based Learning to Support Psychomotor Assessment

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**Abstract.** This study aims to describe the analysis of the implementation of collaboration and communication skills through project-based learning to support psychomotor assessment. This study used descriptive qualitative method. The research subjects consisted of 66 teachers at SMPN 4 Jombang and SMPN1 Gresik, with research instruments consisting of questionnaires, observations, interviews. Validity of research data using triangulation of sources and techniques. The data collection method consists of making observations related to the implementation of project-based learning, giving a 10-item questionnaire, conducting interviews to find out the implementation of communication and collaboration referring to documentation. The results showed that teachers applied several projects to develop collaboration and communication, including making eco-prints and anti-bullying notes, where teachers gave freedom to determine themes and presentations. Teachers have implemented work indicators effectively and respect the team and are willing to compromise to achieve common goals. It is expected that teachers apply project-based learning in a variety of ways to further develop student collaboration and communication in various fields.

**Keywords:** Collaboration, Communication, Project-Based Learning, Psychomotor Assessment

## 1 Introduction

Communication and collaboration are two things that are interrelated and very important in education. Communication is the process of two or more people interacting to convey information, ideas, or feelings [1], [2]. while Collaboration is the act of individuals and groups working together to make decisions together and can also be defined as the process of working together to spawn ideas or ideas and solve problems together towards a common vision [1], [3]. Good collaboration is being able to bring

many ideas together into one and come up with better solutions that fit existing problems.

Good communication can facilitate collaboration within the team and achieve certain goals. Good collaboration can bring many ideas together and come up with better solutions [2], [4]. Teachers must understand deeply about collaboration and communication as psychomotor assessment efforts in school students. Teachers need to understand the theory of collaboration and this will be maximized because teachers have personal experience in collaboration, namely how to work together in teams that have been done both in school activities and activities outside school. Collaboration that must be done by teachers is the need to work together with other co-teachers to develop effective learning strategies, share resources, and support each other in facing challenges in the classroom. As a teacher, you must understand that each student has different skills and strengths.

Therefore, teachers must be able to identify and utilize these skills in the context of collaborative learning, teachers must also understand theory and be able to practice these concepts in daily activities that are communication which is very important for teachers, teachers must understand the importance of communicating clearly and effectively to their students. This includes the ability to explain the subject matter in language appropriate to the student's level of comprehension. In previous research, it was explained that communication can be done by listening, that is, an effective teacher must be a good listener. This means listening carefully when students speak, understanding their needs, and responding appropriately. Furthermore, by looking at students' body language, teachers must realize that their body language can send a strong message [3], [5]. Therefore, an understanding of body language and appropriate facial expressions is important in communication with students, the last is nonverbal communication and intercultural communication so that the learning process in the classroom can be very effective when the teacher's understanding of communication is very deep.

Project-Based Learning (PBL) is a learning method that engages students in real projects that last for a considerable period of time, from a week to a semester, that allows students to solve real-world problems or answer complex questions[6], [7]. In PBL, students demonstrate their knowledge and skills by creating a product or public presentation for a real audience. PBL is more than just "working on a project". In PBL, students investigate and respond to authentic, interesting, and complex problems or challenges with deep and sustained attention[8], [9]. The main characteristics of PBL include presenting questions that are open, moderately complex, and related to knowledge gained through classroom lessons, as well as requiring in-depth research, combining existing knowledge, and finding solutions in the form of a final project. PBL projects should begin with students asking about problems and generating ideas[10], [11].

Teachers' understanding of communication and collaboration is essential in the context of Education. Understanding of communication obtained by teachers from personal experience that can be implemented to students in psychomotor assessments. Psychomotor assessment is a process of evaluating physical skills that also involves factors such as team coordination and good communication. This research can help

clarify how these factors affect assessment results. Psychomotor assessment can assist educators in evaluating learning outcomes and improving future learning processes. Modern education increasingly emphasizes the importance of developing all aspects of the individual, including psychomotor aspects. Collaboration and communication are very important social skills in everyday life and the world of work. Understanding how understanding collaboration and communication contributes to the assessment of psychomotor skills can aid the development of more holistic education and can help teachers design more effective teaching methods. It can also support students' collaborative and communicative skills development. Research on the Effect of Understanding Collaboration and Communication on the Preparation of Psychomotor Assessments in the Teaching Module was carried out in two junior secondary schools, namely SMPN 1 Gresik and SMPN 4 Jombang. The purpose of the study is to determine communication and collaboration skills and the impact on psychomotor assessment in teaching modules, so that this research can be a good evaluation for teachers in the future what must be done to get a psychomotor assessment formula in student teaching modules.

## **2 Research Method**

### **2.1 Research Design**

This research is qualitative research with a descriptive approach. The subjects of this study were teachers of SMPN 1 Gresik and SMPN 4 Jombang, where there were 66 teachers with various subjects. The research instrument consists of observation sheets, interview guidelines, and questionnaires. The data collection method consists of making observations related to the implementation of project-based learning, providing questionnaires for the identification of the implementation of psychomotor assessments as many as 10 items, conducting interviews to find out the implementation of communication and collaboration developed with reference to documentation. To determine the validity of research data, researchers use triangulation of sources and techniques.

Indicators of collaboration in this study include: (1) Work effectively and respect the team; (2) have flexibility and are willing to help the team; (3) Willing to compromise to achieve common goals; (4) Take shared responsibility for collaboration and reward team contributions. While the communication indicators in this study include: (1) Articulating ideas, thoughts orally, in writing, and nonverbally; (2) Listening effectively to articulate the meaning of knowledge, values, attitudes; (3) Use communications for various purposes; (4) Use a variety of media and technologies for communication and understand their impact; and (5) Communicate effectively with diverse environments.

### **2.2 Research Procedure**

The research procedure is a stage in order to obtain objective and accountable data . Research procedures include: (1) planning in designing research, compiling research

designs related to research preparation, preparing research instruments, and browsing articles related to research focus, (2) implementation in data collection, using triangulation methods, namely interviews, observation and documentation, and questionnaires. The stages of implementation are equipped with research instruments that have been arranged systematically and completely, and (3) preparation of research reports, research results that are clearly arranged based on writing methods, research systematics with scientific language.

### 2.3 Analysis Techniques

This research analysis technique consists of data reduction, data exposure, data categorization and drawing conclusions. Data reduction is carried out to determine data that is directly related to the purpose of research[12]. Data presentation aims to present data that has gone through a reduction process with the aim of making it easier to understand each information. Data categorization aims to make it easier to classify data according to research indicators. Drawing conclusions with the aim of making it easier for researchers to find out the common thread of the entire research process that has been carried out.

## 3 Result

### 3.1 Characteristics of respondents based on education level

The results of filling out questionnaires by respondents, data on the characteristics of respondents based on education last shown in Table 1 below.

**Table 1.** Characteristics of respondents based on recent education

No	Education Level	Sum	Percentage
1	Bachelor (S1)	56	84,8%
2	Magister (S2)	10	15,2%
3	Doctor (S3)	0	0%
	Sum	66	

Based on Table 1 above, respondents with the last education of Bachelor degree (S1) were 56 people or 84.8% and respondents with the last education of Master degree (S2) were 10 people or 15.2% while there were no respondents with the last doctoral education. This shows that most of the research respondents were educated Sarjana.

### 3.2 Characteristics of respondents based on length of teaching

The results of filling out questionnaires by respondents, data on respondents' characteristics based on teaching duration are shown in Table 2 below.

**Table 2.** Characteristics of respondents based on teaching time

No	Teaching Duration	Sum	Percentage
1	< 3 years	10	15,2%
2	3-5 years	10	15,2%
3	6-10 years	3	4,5%
4	> 10 years	43	65,1%

Based on Table 2 above, it is obtained that the experience of teachers who teach less than 3 years is 10 people or 15.2% while the length of teaching between 3 to 5 years is 10 teachers or 15.2%. The number of teachers who have teaching experience for 6 to 10 years is 3 years or 4.5% and the number of teachers who have teaching experience for more than 10 years is 43 teachers or 65.1%. This shows that the majority of research respondents have had teaching experience for more than 10 years or can be said to be senior in teaching. Questionnaires given to teachers about collaboration in Table 3.

**Table 3.** Results of the questionnaire on the collaboration that has been implemented

No	Question items	Options	
		Already	No
1	Has the teacher become a model for students who are skilled in collaboration?	52	14
2	Do teachers carry out learning by emphasizing collaboration skills?	57	9
3	Do teachers provide opportunities for students to work in diverse teams?	62	4
4	Do teachers encourage participants to be active collaborators?	58	8
5	Do you provide exercises to improve cooperation in classroom practice?	59	7

Based on Table 3 above, in question 1 as many as 52 teachers stated "yes", meaning that 78.79% stated that it had become a model for students who were skilled in collaboration, while as many as 14 teachers stated "no", meaning that as many as 21.21% stated that they had not become a model for students who were skilled in collaboration. This shows that teachers still need to develop themselves through training and coaching that aims to help students in collaboration skills according to the teacher model.

In question 2, as many as 57 teachers stated "yes", meaning that as many as 86.36% of teachers stated that they had carried out learning by emphasizing collaboration skills, while as many as 9 teachers stated "no", meaning that there were 13.64% of teachers who stated that they had not carried out learning by emphasizing collaboration skills. This certainly needs to be a concern for school principals to always motivate teachers in implementing learning that leads to the development of student skills.

In question 3, as many as 62 teachers said "yes", meaning that as many as 93.94% of teachers provide opportunities for students to work in diverse teams. While as many as 4 teachers stated "no", meaning that as many as 6.06% of teachers stated that they had not provided opportunities for students to work in diverse teams. This shows that the majority of teachers are good at giving students the freedom to collaborate on classroom and outside class activities.

In question 4, as many as 58 teachers stated "yes", meaning that 87.88% of teachers stated that they had encouraged participants to become active collaborators, while as many as 8 teachers stated "no", meaning that there were 12.12% of teachers who stated that they had not encouraged participants to become active collaborators. This shows that the teacher community has motivated students to always be active in collaborating in every activity, especially project-based learning.

In question 5, there were 59 teachers who said "yes", meaning that 89.39% said they provided exercises to improve cooperation in classroom practice. While as many as 7 teachers stated "no", meaning that there were 10.61% of teachers who stated that they had not provided exercises to improve cooperation in classroom practice. This shows that there needs to be an understanding and improvement in teachers that the importance of cooperation in students when conducting project-based learning.

Based on the results of the questionnaire above, if it is associated with indicators of collaboration skills, teachers have applied the indicators to: (1) Work effectively and respect the team, and (3) Willing to compromise to achieve common goals. While the indicators that need to be improved are indicators (2) have flexibility and are willing to help the team and (4) Jointly responsible for collaboration and respect. This is in line with research [4], [13] that the role of collaboration skills in students can improve character attitudes of mutual respect and increase emotional among students.

Based on the results of questionnaires given to teachers about collaboration associated with Psychomotor assessment are shown in Table 4.

**Table 4.** Results of the questionnaire on communication that the teacher has applied

No	Question items	Options	
		Already	No
1	Has the teacher become a model of communication skills for students?	52	14
2	Can you emphasize good communication skills for students in the classroom?	60	6
3	Have you motivated students to give varied oral presentations in class?	55	11
4	Can teachers encourage students to become better communicators?	61	5
5	Can you encourage students to use technology and media to communicate innovatively and effectively?	62	4

Based on Table 4 above, in question 1 there were 52 teachers who stated "yes", meaning that as many as 78.79% of teachers stated that it had become a model of communication skills for students, while as many as 14 teachers stated "no", meaning that there were 21.21% of teachers stated that it had not become a model of communication skills for students. This shows that teachers have been able to become good communication models for students, but there is still something that needs to be improved from teacher communication, especially in project-based learning.

In question 2, there were 60 teachers stating "yes", meaning that as many as 90.91% of teachers stated that they had been able to emphasize good communication skills for students in the classroom. While as many as 6 teachers who stated "no", meaning that as many as 9.09% of teachers who stated were not able to emphasize good communication skills for students in the classroom. This shows that the majority of teachers at SMPN 1 Gresik and SMPN 4 Jombang have been able to develop students' communication skills in classroom and outside the classroom.

In question 3, there were 55 teachers who stated "yes", meaning that as many as 83.33% of teachers stated that they had motivated students to give varied oral presentations in class. While there were 11 teachers who said "no", meaning that there were 16.67% of teachers who stated that they had not motivated students to give varied oral presentations in class. This shows that the majority of teachers have provided encouragement, support and become good facilitators for students, especially in making presentations in front of the class.

In question 4, there were 61 teachers who said "yes", meaning that as many as 92.42% of teachers stated that teachers can encourage students to become better communicators. While as many as 5 teachers stated "no", meaning that there were 7.58% of teachers who stated that teachers have not been able to encourage students to become better communicators. This shows that the majority of teachers have been able to encourage students to communicate ideas well in front of the class.

In question 5, there were 62 teachers who stated "yes", meaning that as many as 93.94% of teachers stated that teachers were able to encourage students to use technology and media to communicate innovatively and effectively. While as many as 4 teachers stated "no", meaning that as many as 6.06% of teachers stated that teachers

have not encouraged students to use technology and media to communicate innovatively and effectively. This shows that the majority of teachers are already good at integrating technology to develop student communication in project-based learning. In the opinion of [14], [15] that the application of technology in learning can support teachers to develop students' potential in the form of soft skills and hard skills. Overall regarding the results of the questionnaire on communication, the indicators that were fulfilled were Listening effectively to describe the meaning of knowledge, values, attitudes; Using various media and technologies for communication and understanding their impact; and Communicate effectively with the diversity of the environment.

Next, researchers conducted interviews with principals and teachers regarding collaboration and communication skills developed in students to support psychomotor assessments. The results of interviews between researchers and principals are as follows.

Researcher : What policies are implemented by schools to support mobilizing school programs?

Principal : The school conducts several programs that are attributed to the characteristics of the school and integrated with technology. Teachers are given the freedom to organize project-based learning by referring to the criteria of the driving school.

Researcher : What is the process of psychomotor assessment that has been carried out by teachers, especially in the learning process in the classroom?

Principal : So far, teachers have done more psychomotor assessments when learning sports or practice, while for classroom learning teachers usually do assessments in groups when making projects.

The results of interviews conducted with teachers regarding the development of collaboration and communication skills are shown as follows.

Researcher : What is the process of developing students' collaboration skills during the project-based learning process?

Teacher : students are given assignments in groups that are heterogeneous, both from ability and gender. It aims to provide opportunities for students to be able to become peer tutors when conducting group discussions

Researchers : what are the challenges faced when developing students' collaboration skills?

Teacher : the nature of individualism in students when carrying out project activities, where there are students who dominate more in completing tasks. In other words, students who have intellectual limitations will be left behind. However, that's when I as a teacher gave an understanding that each member must have a role to complete the task together.

Researchers : how to develop student communication in project-based learning?



Teacher : provide opportunities for each group to convey project results through presentation activities in front of the class. Each member has the same opportunity to deliver the results of the group discussion, as well as for the audience is also given the opportunity to give responses

Researcher : how to motivate students who lack good communication skills?

Teacher : I will give students the freedom to express their opinions using simple language. In addition, I will reward every student who dares to submit questions and responses and ensure that every opinion expressed is correct.

Furthermore, the activities that have been carried out by students related to collaboration and communication skills at SMPN 1 Gresik and SMPN 4 Jombang are shown in Figure 1.



**Fig. 1.** Project Activity students create illustrated narratives

Based on Figure 1 above, the teacher gives a project to students to construct a narrative accompanied by the object. The teacher forms students into several groups, where each group consists of 6-7 students. Each group is given a predetermined theme according to group agreement. The teacher asks each group to determine the group leader and choose the sub-theme of the group. Project tasks are done within 4 meetings with each meeting having an activity schedule.

Furthermore, the project carried out by students to develop collaboration and communication skills through the activity of compiling anti-bullying notes in the Indonesian lesson shown below.



**Fig. 2.** Anti-bullying record preparation project



**Fig. 3.** Student presentation of project results

Based on Figure 3, teachers have developed collaboration and communication skills through project presentation activities. The teacher becomes a facilitator for smooth class discussion, as well as providing motivation to students to be able to convey the results of work, ideas and ideas. This is in accordance with the opinion [7], [16], [17] that collaborative students are a way to achieve common goals and responsibilities through cooperation especially with regard to psychomotor assessment. Some elements of collaboration are having flexibility and willingness to help, being able to work effectively and respecting diverse teams, being able to make the necessary compromises to achieve common goals, valuing individual contributions as team members, and having a shared responsibility to be collaborative. Further according to [18], [19].that collaborative as one of the essential skills of the 21st century, especially with regard to projects.

According to [20], [21] that students who successfully study and work in the digital age need skills to manage diverse information, collaborate with others and create new ideas. There are collaborations that can be developed in students, including negotiation, advocacy, and cooperation. Meanwhile, according to [3], [22] learning in the 21st century is still lacking for the development of student collaboration. Therefore, teachers need to improve learning by using digital learning tools in order to facilitate student collaboration skills.

That is a student's communication skills is the skill of expressing thoughts, communicating coherent instructions articulating clearly and sharply opinions, and motivating others through powerful speech [22], [23]. Communication has elements including articulating thoughts and ideas effectively using oral, listening effectively to decipher meaning (knowledge, values, attitudes, and intentions), written, and non-verbal in various forms and situations, using various media and technology, use communication for a variety of purposes (e.g. to inform, instruct, motivate, and persuade), and know and assess how it impacts, and communicate effectively in diverse environments.

## 4 Conclusion

Based on the results of the study showed that teachers implement project activities that utilize the environment and technology to develop students' collaboration and communication skills. Projects given by teachers are more demanding for cooperation and team, where each group has freedom in determining the theme of the project being worked on. Teachers have implemented work indicators effectively and respect the team and are willing to compromise to achieve common goals. It is expected that teachers apply project-based learning in a variety of ways to further develop student collaboration and communication in various fields and environmental conditions.

## 5 Authors' Contributions

The contribution of researchers is adjusted to the field and expertise. Author 1 contributes to compiling research instruments and concepts, author 2 performs data processing and author 2 contributes to presenting data and representation of research results.

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