

IMPLEMENTATION OF TEACHER COMMUNICATION TOWARDS THE APPLICATION OF PROJECT BASED LEARNING MODEL IN BIOLOGY SUBJECTS

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Keywords:

Teacher, Communication, Project-Based Learning, Biology.

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Abstract: The urgency in this research is biology is difficult for students to understand if there are no concrete examples in daily life. The researchers want to analyze the implementation of teacher communication regarding the application of the project-based learning model in biology subjects. This research uses qualitative methods. The research subjects in this study were teachers who teach biology subjects at SMA Negeri 8, Medan, and students as triangulation informants. Data collection techniques done through non-participant observation, in-depth interviews, and documentation studies. Data analysis techniques are applied through the Miles and Huberman model: data reduction, data presentation, and conclusion. This research shows that implementation of teacher communication regarding the implementation of the PjBL in biology subjects consists of an openness pattern, the element contained in it is to evaluate the results of work and experience which contains elements of the teachers will ask for feedback from the students; empathetic communication patterns contain elements of determine essential questions; supporting communication patterns includes planning the project design, map activities and controlling the progress; the positive feelings communication pattern consists of elements of testing the work of students; and equality communication patterns include the elements of evaluate the results of work and experience.

INTRODUCTION

Project-Based Learning is a learning that can provide facilities for students to work individually and in groups. To encourage students to produce work contextual to the teacher, they can strive to implement innovative learning models, and one of which is through the PjBL learning model (Nurhadiyati, *et all*, 2021). Based on learning, the project will emphasize contextual learning, a model or learning approach through complex activities (Sani, 2014). Student's project-based learning will act as a learning

center. Students will be involved by focusing on gathering information and its use to produce a report, experiment, or project (Nakada, *et all*, 2018). Implementing PjBL is appropriate because it is a model of learning that will position students at the center of the learning process. Students will be prepared to face actual events. Implementation of PjBL able to influence student learning outcomes due to the learning model project-based makes students able to play an active role in allocating time, understand the project, and provide experience for students (Nurhadiyati, *et all*, 2021).

The learning process created by the teacher greatly influences the participants' learning outcomes educate. An exciting learning process will provide interest to students indirectly to be more active during the teaching and learning process. Students can be used as learning subjects that position the participants. Students are active in constructing their knowledge (Saputra, *et all*, 2013). Students who increase their participation will also improve their understanding of the material lessons. Increased understanding of this learning concept will make student learning outcomes more optimal.

When the researchers made observations with several teachers at SMA Negeri 8, Medan, they said that one of the many subjects that apply PjBL, Biology has its own challenges in applying the project-based learning model. Researchers obtained information in the learning process. Teachers still need to apply learning models that involve students. Learning is dominantly centered on the teacher (teacher center). Teachers also apply several learning methods, namely lecture, discussion, and question-and-answer methods. However, these conditions have not been able to optimize the biology learning process. Insufficient student involvement causes fewer students to focus attention on the learning process. Application of the lecture method and learning models that do not involve students are considered inappropriate because students are only recipients of information. Less optimal process learning will have an impact on students' motivation and learning outcomes. Process learning that does not involve students makes students memorize to master biology concepts. Students will try to remember and hoard the information they remember so that students will have difficulty in learning to implement in new situations and cause students to losing motivation and activeness in learning and causing the decline student results (Sanjaya, 2011).

Selecting a learning model that can motivate students to obtain good learning results is one of the demands of becoming a teacher. Teachers try various ways to improve the results of cognitive learning and motivation, one of which is the application

of communication in the model learning that is varied and can involve students in the classroom learning process. The learning model aims to explain the learning process in a concept that will be reviewed from thought patterns and patterns of learning actions (Abidin, 2016). A moment of understanding students increases through communication between teachers and students so students can create solutions for solving a problem.

Humans must communicate, which means they need other people and require groups or communities to interact. It is a fact that most humans are formed from the results of social integration with others in groups and society. Communication is a vital thing. Communication is not only crucial in learning because if we involve communication only in learning, other results will not be optimal. Communication is the most critical thing fundamental to involving teachers and students in an emotional approach. With an emotional approach, teachers and students can consider more concerning studies.

Based on the background described, it is deemed necessary to conduct research titled "Implementation of teacher communication towards the application of project-based learning methods in biology subjects." Based on the explanation that has been discussed, the formulation of the problem in this study is that students need more involvement in the learning process. Through this research, it will be seen how the communication application is formed through teachers to students in the learning process as the aim of this research.

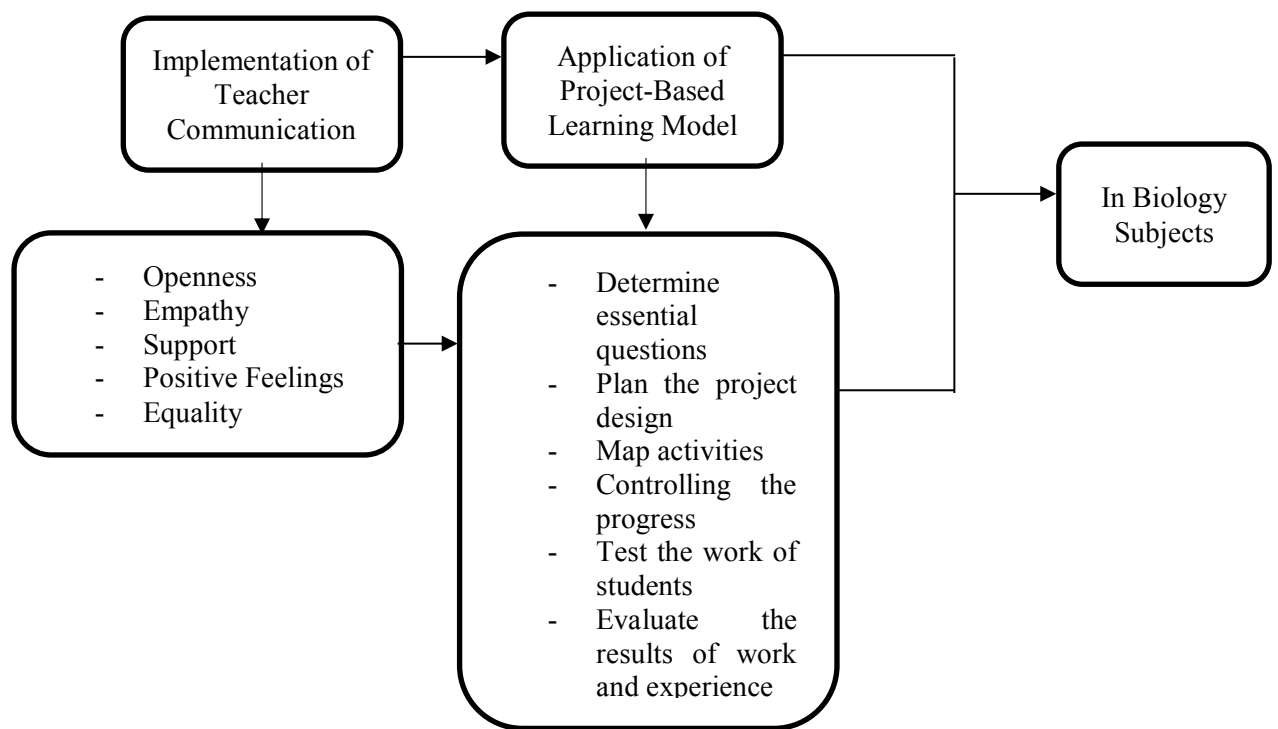
The benefit of this research for the general public is that it can increase readers' knowledge regarding teacher communication in implementing the project-based learning model in biology subjects. Meanwhile, the benefit for the teacher is that it can add alternatives to how to implement communication in the learning model so that students can be more active in the learning process. Meanwhile, the benefit for schools and students is that it can provide information about the importance of communication between teachers and students in the teaching and learning process and make students more active and enthusiastic in learning interaction.

RESEARCH METHODS

The research method used in this research is interpretive qualitative. Interpretive qualitative research is a type of research that seeks to find explanations about various social or cultural phenomena that are based on the researcher's perspective and

interpretation in looking at these socio-cultural events. The study aspect of this research is knowing and analyzing how teacher communication is implemented regarding applying the project-based learning model in biology learning. Meanwhile, the subjects or informants in this research are teachers who teach biology subjects. Data collection techniques were applied in two ways, namely interviews and documentation studies. Meanwhile, the data analysis technique uses the Miles and Huberman model, which consists of three stages: data reduction, data presentation, and conclusion.

Figure 1. Conceptual Frame Work



(Source: Researchers, 2023)

RESULTS AND DISCUSSION

Table 1. Data Reduction

No	Teacher Communication				
	Openness	Empathy	Support	Positive Feelings	Equality
1	The teachers will ask for feedback from the students learn by giving feedback regarding the material that has been presented	The teachers greet and give motivational words to students to be enthusiastic about learning biology material, which can be	The teachers will assess with assessment instrument to find out the level of acceleration of the indicator	Reflecting on learning which has been done	The teachers and students provide the conclusion of the learning material just underway

		considered not easy to understand				
Project-Based Learning						
No	Determine essential questions	Plan the project design	Map activities	Controlling the progress	Test the work of students	Evaluate the results of work and experience
1	The teachers will give apperception to learners	The teachers divide students into small groups	The students will create projects that have been determined according to existing instructions in guiding project work for 2 meetings.	The students will work on projects on activities 1, 2, 3, and 4 as work guide project	The students will display products made in front of the class and explain them	The students will present products that have been made
2	-	The teachers will distribute the guide project work and explain activities what students must do	-	The teachers will monitor and facilitate students while working on the project	-	The teachers will assess the completeness of the product content
3	-	The students will be invited to do so discussions to complete existing projects explained	-	The teacher will pay attention to students' engagement during the work process project	-	The students will be asked to express feelings and experiences after completing the project
4	-	-	-	-	-	Carry out a post-test at the end of the learning session

(Source: Researchers, 2023)

The table above is a representation of data reduction by Miles and Huberman which is displayed in this research as a data display. Data reduction is simplifying, classifying, and discarding unnecessary data so that the data can produce meaningful information and make it easier to conclude. Based on the above data acquisition, the initial conclusion that researchers can draw is that there are similarities between teacher communication and the six stages of project-based learning. Thus, researchers will combine the discussion of teacher communication with the project-based learning stages as a unit that creates teacher communication patterns in learning methods, with the hope that other teachers can implement the communication formed.

Openness is a willingness to respond happily to information received in interpersonal relationships (Nisa, 2020). The form of activities illustrates the openness in this study; the teachers will ask for feedback from the students by giving feedback regarding the material that has been presented. Furthermore, the openness here is further described by the 6th stage of project-based learning, namely evaluating the results of work and experience. In the sixth stage, the students will be asked to express their feelings and experiences after completing the project. At this 6th stage, the communication pattern that is formed is considered a solution to the problems that have been present between teachers and students. According to the statement of the biology teacher at SMA Negeri 8, Medan, many teachers still act as teacher centers, and communication only goes in one direction. This context is also related to one of the core competencies in the biology lesson plan. This component states that through biology subjects, it is hoped that students can appreciate and practice honest, disciplined, responsible, and caring behavior (cooperation, tolerance, peace), polite, responsive, proactive and demonstrate attitude as part of the solution to various problems in interacting effectively with the social and natural environment and placing oneself as a reflection of the nation in the association of the world.

Empathy is a feeling about what other people feel (Nisa, 2020). Empathy, in this case, refers to the discussion regarding the teacher greeting and giving students motivational words to be enthusiastic about learning biology material, which can be considered challenging to understand. Based on the results of non-participant observations and interviews, the researchers found that students needed help learning to absorb biology learning material, especially material that must be understood in a process such as excretory system matter. The students find it challenging to understand the process of urine formation on the excretory system material because it is assessed as very complex.

Therefore, to apply this empathy, teachers apply the first stage in project-based learning, namely determining essential questions in the initial activities. Teachers explore students' knowledge about the definition of excretion and its organs. Teachers motivate by conveying the benefits of studying human system excretion to implement it in maintaining organ excretion. The teacher will give apperception to students like "What happens to our body after exercising?" "How can our body excrete urine?" The teacher explains the essential competencies and indicators of learning to be achieved. Explain the

assessment techniques used.

After the initial activities are finished, the teacher enters the main activities, where they will ask an introductory question like: "What are the processes of excretion in humans?" "What is the role of human bile?" "How can humans breathe?" The teacher will explain simply excretory system material, including definitions of excretion, secretion and defecation, liver, lungs, skin, and kidneys as well as the function and disorders of the human excretory system. The teachers believe that asking questions at the beginning of the meeting can relieve students' feelings of stiffness and anxiety about biology. So, students will not be surprised if the teacher goes straight to the stage of explaining biological material more complexly, and this means that introductory questions can be considered a sense of teacher empathy in their communication patterns.

Support is a situation that is open to support communication going on effectively (Nisa, 2020). The discussion regarding the communication pattern for providing support can be represented in the plan of the project design stage. The first element in this stage is that the teacher divides students into small groups with goals that align with project-based learning, namely collaborating with their group friends and improving their communication skills. The second and third elements in the plan project design are that the teacher will distribute the guides' project work and explain activities that students must do. Students will be invited to do a discussion to finish the project that has been explained. Applying the PjBL learning model in the learning process will improve the soul competitive students to successfully work on the project as best as possible to be the best group. This competitive spirit is obtained through group organizing (Hapsari, *et all*, 2019).

Apart from planning the project design, the communication pattern that can be formed in terms of providing this support is map activities. Mapping activities can be done by estimating the project completion time by preparing an activity schedule, and the teacher also does this by instructing students to do projects that have been completed determined according to existing instructions in guiding project work for two meetings. The competency indicator that must be possessed by every student studying biology for the subject of the human excretory system is to distinguish between the definitions of excretion, secretion, and defecation—creating a poster of the liver organ and its function as a means of excretion. Design a poster of the lung organ and its function as a means of excretion. Design a poster of the skin organ and its function as a means of excretion. Describe the function of the kidney and demonstrate the process of urine formation.

Identify disorders of the human excretory system.

Controlling the progress is also a series of communication patterns in providing support. So, through this communication pattern, we will be able to achieve the core competencies formed by the teacher, including understanding, applying, and analyzing factual, conceptual, and procedural based on his curiosity about science, technology, arts, culture, and humanities with humanitarian insights, nationality, statehood, and civilization related to the causes of phenomena and events, as well as applying procedural knowledge in the field of study specific ones according to his talent and interest in solving the problem. Processing, reasoning, and presenting in the concrete and abstract realms related to developing what he learned at school, independent and able to use methods according to scientific principles.

During the student learning process, conduct discussions to work on the project; they were trying to understand the material to make the contents of the project and master the material to present and demonstrate the project. Apart from engaging students in the learning process, the teacher's influence as a facilitator also affects students' learning motivation. A capable teacher determining his position as a learning supervisor will help students to increase their motivation to learn. In line with Sukmana & Amalia (2021) state that the PjBL learning model is a learning model that is effective because learning is centered on students, and teachers act as a controller so that students can explore the material, learn more optimally, and produce a project as a form of actual learning outcomes.

Positive feeling means one must have positive feelings against himself, encourage others to participate more actively, and create situations where communication is conducive to effective interaction. The positive feeling in this study is manifested in reflecting on the learning that has been done. Reflection means the process of looking back at the activities that are being carried out.

In biology lessons, students must make connections between theory and events around it. So, every individual who studies it is required to study it in theory and practice it in real life. In implementing a plan, the project design and map activities in project-based learning are in line with the benefits of the PjBL learning model, namely that it will encourage students to do work to improve learning motivation; demanding students to solve problems; PjBL demands to be more active in solving problems that arise there is; learners will be given real experience in practice and making projects with existing

resources and implemented in the real world; and creating a fun learning atmosphere (Kurniasih, 2014).

Trying to create a situation conducive to communication for effective interaction is realized by testing students' work in the PjBL model; the students will display products made in front of the class and explain them. By presenting the project, the teacher directly applied the essential competencies aimed at his students, namely presenting the results of an analysis of abnormalities in the structure and function of organs that disrupt the human excretory system through sharing form of media presentation. Furthermore, the project presented is the result of an analysis of the relationship between the tissue structures that make up organs in the excretory system and link it to the excretory process so that can explain the mechanism and possible functional disorders that occur in the human excretory system through literature studies, observations, experiments, and simulations.

The final element of teacher communication is equality. Equality is a tacit acknowledgment that both parties value, benefit, and have something important to contribute (Nisa, 2020). However, in this case, the confession is not done secretly but openly between the teacher and the student. Because the teachers and students conclude the learning material through their class interactions.

In the context of equality, the stage of project-based learning, by definition, lies in Evaluating the results of work and experience. At this stage, the series of elements contained in it is after the students present the products that have been made, then the teachers will assess the completeness of the product content and finally Carry out a post-test at the end of the learning session. All of these elements are carried out to determine whether the learning objectives are achieved. The objective indicators in learning biology with material on the human excretory system include: Through discussion activities, students can differentiate definitions of excretion, secretion, and defecation; students can create a poster of the liver organ and its function as a means of excretion; students can design a poster of the lung organ and its function as a means of excretion; students can design a poster of the skin organ and its function as a means of excretion; students are able describe the kidney organ and its function as a means of excretion and demonstrate the process of urine formation; and students can identify disorders of the human excretory system.

The explanations given by the informants in this study were in line with the informants' triangulation of data or as the validity of the information, in this case, students

who received biology lessons. The students said they could better answer the teacher's questions about the human excretory system because it related to understanding and implementation in students' real lives. In addition, in making the project map, they said that applying the PjBL learning model to the excretory system material allowed students to associate it with real life and apply it in their everyday lives. The PjBL learning model can improve students' activeness in the learning process. PjBL provides space for students to learn things meaningfully and not monotonously, thus making students more interested in the learning material and providing motivation and encouragement for students to learn (Safithri, *et all*, 2022).

CONCLUSION

Based on the results and discussions presented previously, it can be concluded that the implementation of teacher communication regarding the implementation of the project-based learning model in biology subjects consists of an open communication pattern, where the element contained in it is to evaluate the results of work and experience which contains elements of the teachers will ask for feedback from the students learning by giving feedback regarding the material that has been presented; empathetic communication patterns that contain elements of determine essential questions; communication patterns for providing support which includes planning the project design, map activities and controlling the progress; the positive feelings communication pattern consists of elements of testing the work of students; and equality communication patterns which include the elements of evaluate the results of work and experience.

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