Enhancing Learning Outcomes: Medical Students' Perceptions of Effective Feedback in Problem-Based Learning

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Abstract—**Effective feedback is a critical component of Problem-Based Learning (PBL), particularly in medical education, as it enhances critical thinking, problem-solving skills, and academic performance. Despite its importance, student perceptions of feedback effectiveness in PBL remain diverse, with limited understanding of its impact on learning outcomes. This qualitative study employed a phenomenological approach to explore medical students' perceptions of feedback in PBL sessions at Universitas Swadaya Gunung Jati. A total of 234 students across first, second, and third-year levels were selected through stratified random sampling. Data were collected via open-ended questionnaires distributed through Google Forms and analyzed thematically to identify key themes. The analysis revealed three main themes: (1) Feedback Quality—students valued specific, clear, and evidence-based feedback over vague or general comments; (2) Timing of Feedback—immediate feedback post-PBL sessions was more effective compared to delayed feedback; and (3) Trust in Feedback Providers—students responded better to feedback from competent and trusted tutors. Constructive feedback improved motivation, confidence, and self-reflection, enabling students to address weaknesses and enhance performance. Effective feedback in PBL requires clarity, timeliness, and a strong relationship between students and tutors. Institutions should train tutors to deliver high-quality feedback and consider incorporating technology to provide timely and constructive feedback. This study offers insights for optimizing feedback practices in PBL to improve learning outcomes in medical education.**

Keywords— ***PBL; effective feedback; student's perception***

I. INTRODUCTION

Problem-Based Learning (PBL) is a learning method that uses a student approach to problems so that students can grow their own skills and knowledge. This learning model uses real life problems which function as material that students must study in order to train and of course improve critical thinking and problem solving skills.[1], [2]

The tutor plays an important role in determining the success of the tutorial. As a facilitator, the tutor's role is to develop the learning process and keep cooperation between groups active in their interactions with each other. Apart from that, a tutor is also tasked with providing feedback as input to students regarding problem solving skills (solving a problem based on data and information that has been obtained with clinical reasoning skills), self-directed learning skills (learning independently), the ability to participate to make a contribution, the ability to collaborate between teams and the ability to communicate effectively.[3], [4].

Feedback can be defined as information obtained to describe a student's performance in a task or activity provided with the aim of providing guidance and similar activities in the future. Feedback has many purposes, one of which is to

increase achievement, develop understanding and can motivate students by encouraging their efforts in the learning process.[5]

Feedback is given by the tutor which functions as an assessment of student performance during the tutorial. Feedback is an important assessment because if it is given effectively, it will increase student performance in paying attention to mastery of the material and be motivated to continue improving their knowledge. The lack of quality feedback provided by tutors can create a gap between tutors and students regarding the learning goals that must be achieved.[6]

Feedback is often considered unsatisfactory due to lack of mastery of the material on the topics discussed in the tutorial. Tutors also often assume that tutorial discussions must be carried out independently by students without intervention, which often results in little feedback being given and explanations of shortcomings that are not detailed during the discussion.[6]

This research was conducted to analyze students' perceptions of the effectiveness of feedback during PBL to determine the implementation of providing feedback by tutors during PBL and the effectiveness of feedback in PBL according to student perceptions.

II. METHOD

This research is exploratory research that uses open questions. This research was conducted by the Faculty of Medicine, Universitas Swadaya Gunung Jati. The population in this study were students at the Faculty of Medicine, Universitas Swadaya Gunung Jati, Cirebon. This qualitative study employed a phenomenological approach to explore medical students' perceptions of feedback in PBL sessions at Universitas Swadaya Gunung Jati. A total of 234 students across first, second, and third-year levels were selected through stratified random sampling. Data were collected via open-ended questionnaires distributed through Google Forms and analyzed thematically to identify key themes.

III. RESULTS AND DISCUSSION

The sample for this research used 234 students in Faculty of Medicine of Universitas Swadaya Gunung Jati, where the number of respondents was calculated using the Slovin formula with an error rate of 5% and 95% confidence. The selection of respondents in this study used Stratified Random Sampling, which is a sampling process by dividing the population into two or more levels and then taking samples from each level. Based on the data that has been obtained using a questionnaire, it will be described in table form as follows.

TABLE I.   CHARACTERISTICS OF THE SAMPLE PROPORTION REQUIRED IN EACH SEMESTER

No	Semester	Total Sample	Persentage (%)
1	2	88	37,6%
2	4	80	34,2%
3	6	66	28,2%
Total		234	100,0%

Based on the data obtained using a questionnaire, the characteristics of respondents based on gender will be described in table form as follows.

TABLE II.   CHARACTERISTICS OF RESPONDENTS BASED ON GENDER

No	Gender	Jumlah	Persentage (%)
1	Men	88	37,6%
2	Women	146	62,4%
Total		234	100,0%

The table above shows that in the sample consisting of 234 students at level 1, level 2 and level 3, Faculty of Medicine, Swadaya University, Gunung Jati, Cirebon, there were 88 respondents (37.6%) who were men and 146 respondents (62.4%) who were women.

This research is exploratory research, where we gave a questionnaire with 4 questions: (1) Based on your experience, what PBL feedback was the most impressive for you? Explain the reasons why this is impressive for you?; (2) Is providing feedback after PBL important and influential for your learning process? Explain what you think?; (3) Can the feedback you get be followed up at the next PBL meeting?; (4) How do you expect PBL feedback to be provided?.

Analysis of respondents' answers using the content analysis method, as follows:

1. The researcher will read the transcript repeatedly to gain an understanding of the overall content.

2. Meanings that are appropriate to the research objectives are identified as codes.

3. The next step is to analyze the categories at a more interpretive level which results in themes.

4. Determine and name the theme, then synchronize the theme with the transcript data.

5. Create a results report.

The following are the exploration results obtained from respondents based on the questions above.

a. Feedback content

The results of the exploration with students regarding the content of the feedback provided by the tutor and students felt impressive about this, performance and group dynamics.

Statement 1: "At the 1st meeting the tutor always gave poor feedback because there were still many steps where the

direction was not clear, but after setting the schedule at the 2nd meeting the tutor gave feedback that there was progress."

Apart from the students' performance as a whole as a group, there is feedback given by the tutor to individuals.

Statement 2: "The opinions I expressed during first session and second session were in accordance with the topics discussed and were able to answer questions raised by the tutor even though sometimes they were still superficial."

b.   Students' skill in discussion

Several respondents also stated that some tutors also provided feedback regarding students' skills in discussions, for example as a moderator, actively giving opinions, and being able to build a good learning atmosphere and also specific tutor feedback to individuals.

Statement 1: "What impressed me most was when a tutor gave us feedback about our ability to analyze problems holistically. Tutors appreciate our ability to see problems in a broader context, consider multiple visible factors, and explore deeper implications".

Statement 2: "I was able to explain the learning objectives again at the second meeting using my own language and not focus on the literary texts I brought, actively arguing and expressing opinions from the first meeting to the second meeting."

c.   Discussion material

Apart from providing feedback regarding students' performance and skills in discussions, tutors also provide feedback regarding discussion material, but do not give mini lectures. Feedback given by tutors regarding the material, including those mentioned by respondents below:

Statement 1: "When we are told (by the tutor) what is missing in the discussion, it is not just mentioned but explained, because this ensures that we know what is missing."

Statement 2: "To be able to understand the right learning targets, learning for Problem-Based Learning discussions does not only focus on one particular topic being discussed. We also need to understand the surrounding topics so we can understand them in detail and differentiate between them."

Statement 3: "The tutor shares his experience of the material being studied so that I get a better idea of how to apply the material."

Tutors also provide feedback when the material discussed deviates from the given scenario, as stated by the following respondents:

Statement 4: "Feedback regarding the progress of the discussion which was too far from the discussion according to the scenario. By giving warnings, we correct the discussion accordingly, so that the course of the discussion becomes clearer and also has an impact on the PBL quiz."

Feedback from tutors regarding the material is also provided to show the importance of the material in relation to the real world, as stated by respondents below:

Statement 5: "Feedback about emergency material: you only learn about respiratory emergencies in this block and you will actually use it in the emergency room when you become a doctor. If you don't get this material, your patient's life will also be lost."

d.   Learning technique

Feedback content provided by the tutor regarding how to study during PBL time so that students can prepare and utilize PBL time more effectively. The following are respondents' statements regarding this matter:

Statement 1: "Good way to study, how to find good and correct literature according to the learning material because it can help and make it easier for us as students to find good learning resources."

Statement 2: "Feedback that is impressive is feedback that is given thoroughly and the tutor provides feedback regarding what points we still need to learn as students so that in the second meeting the feedback is also one of the things that makes our performance even better."

Statement 3: "If you study, don't just do it when you want to do PBL or have an assignment, study every day and look for the common thread."

Statement 4: "Study harder because that means we can be motivated to study more deeply."

Statement 5: "How to carry out PBL correctly, give feedback at the end of the second PBL meeting before the quiz and when the tutor gives an explanation that is easy to understand before carrying out the quiz, because it can help you take the quiz more easily."

e.   Motivation

Providing feedback in the form of motivation is the content most often given by tutors to students. Some were stated by respondents as follows:

Statement 1: "When I was only able to express one opinion in PBL. The tutor did not reprimand or make sarcasm, but his words indirectly motivated me to be brave in my opinion."

Statement 2: "Don't be afraid to have an opinion because there is nothing wrong with having an opinion."

Statement 3: "Don't be quickly satisfied with today's learning, because tomorrow you may not get the same thing."

Statement 4: "PBL is held to share knowledge, so don't be afraid to have an opinion, it's okay if our opinion is wrong."

Statement 5: "There must be a change for the better, even if it's only 0.001%."

Statement 6: "The tutor gave me feedback that made me want to expand the knowledge that I had not yet mastered."

Statement 7: "Feedback provided by tutors helps to assess our progress and way of learning at Faculty of Medicine."

The motivation provided by tutors can be in the form of motivation to express opinions or be active in discussions, as well as motivation for learning more generally, as well as to do

better self-reflection in order to improve students themselves. Meanwhile, the reasons why students feel that feedback is impressive include:

1. Students feel appreciated

2. Students feel they have received input for improvement at the next meeting.

3. Students get an idea of the importance of the discussion material.

4. Students gain motivation and increase their sense of responsibility

Here are some student statements related to the reason above:

Statement 1: "When tutors ask questions and are asked for independent study, this really helps me to know and direct my learning goals."

Statement 2: "(the tutor) gave enthusiastic feedback and appreciated the resume that had been written with a smile emote and signed."

Statement 3: "When the lecturer's feedback reminds me that the assessment is personal, it makes me more enthusiastic to develop."

Statement 4: "Feedback is when all group members are active in their opinions, can dig deeper into what should be discussed and can answer what the tutor asks, because maybe at that time the scenario being discussed is easy and we can understand, there is a sense of pride in the feedback given."

Statement 5: "In my opinion, feedback that is impressive for me is conveying shortcomings, especially for myself, so that I can evaluate and improve at the next meeting."

Almost all respondents agreed that providing feedback by tutors after PBL had an influence. Some of the influences stated by respondents are as follows:

1. Self-reflection and understanding emotions.

Providing feedback by tutors/lecturers allows students to get input about deficiencies in discussion performance so that they can improve at the next meeting. The following are respondents' statements that support this:

Statement 1: "It's very influential because it can make me better at following PBL and more structured."

Statement 2: "Very influential for the next session, feedback after PBL is always an evaluation for me in the future."

Statement 3: "It's important because we know what we haven't understood and what we have understood and also what we have felt in previous PBL."

2. Increase motivation.

Providing feedback by tutors can also give students motivation to participate in discussions and motivation for lifelong learning. This statement about motivation can be seen from the following respondent's statement:

Statement 1: "Influential because feedback can increase motivation and enthusiasm for learning."

Statement 2: "It was very influential because many tutors conveyed things that needed to be improved in the next meeting so that I myself understood better what I should study in more depth."

Statement 3: "Influential, because it can indirectly stimulate my curiosity and also my motivation to learn."

Statement 4: "Influential, because if you give constructive feedback it really increases your enthusiasm for learning."

Almost all respondents said they followed up on the input given by the tutor, because they felt the importance of the feedback given by the tutor. The following are student expectations regarding the feedback given by tutors:

1. Students expect the feedback given by the tutor to be more specific

2. Giving feedback is carried out following good feedback rules.

3. Feedback is given using good and polite language.

4. Feedback is given to increase motivation and provide appreciation for what has been done.

Based on exploration of students, the provision of feedback is carried out in accordance with the aim of providing feedback in the literature, namely to help students better understand learning objectives, how these objectives influence knowledge and be able to overcome the gap between the abilities each student has and the standards they must meet, so that it is hoped that can provide opportunities for students to recognize their own potential and weaknesses and be motivated to improve those that have not yet been achieved.[7], [8]

Problem-Based Learning is a learning method where students are exposed to real world problems in order to provide an active and innovative learning process. Feedback can be used as motivation and direct students towards the learning goals they want to achieve in an ongoing tutorial session. Providing encouragement to lecturers to carry out various assessments in learning aspects at the level of student competency in mastering lessons.[9], [10], [11], [12]

Learning has interdisciplinary links so that students can solve problems from different points of view. Tutors really determine the success of the learning program. Tutors also play a role in leading the study group, apart from that they also play a role in developing the learning process, maintaining cooperation between participants so that they can play an active role in group interaction. Student perception is very important for evaluation where it is formed from experiences about objects, events, or relationships obtained from inferring information and interpreting messages, especially when given feedback from tutors.[13], [14], [15]

Feedback has a clear purpose, not just a routine given for no reason. Apart from being written on the tutor's assessment sheet, it must also be conveyed clearly directly to the student using language that can be understood by both parties. Feedback provided is timely. As much feedback as possible

should be given as soon as possible after the discussion process takes place so that students immediately know the results of their performance. The feedback given is based on direct observations. Feedback is given by tutors who understand and have experience dealing with problems in discussions and observe student behavior directly during the discussion process so that feedback can be trusted and accepted by students. Feedback that takes place in two directions. Bidirectional feedback allows students to receive information about themselves and the opportunity to discuss with the tutor about the feedback given.[7][16].

IV. CONCLUSIONS

The analysis revealed three main themes: (1) Feedback Quality—students valued specific, clear, and evidence-based feedback over vague or general comments; (2) Timing of Feedback—immediate feedback post-PBL sessions was more effective compared to delayed feedback; and (3) Trust in Feedback Providers—students responded better to feedback from competent and trusted tutors. Constructive feedback improved motivation, confidence, and self-reflection, enabling students to address weaknesses and enhance performance. The provision of feedback by tutors is in accordance with the objectives and provisions for providing effective feedback, and students feel the influence of providing feedback on their learning. Several things still need to be followed up regarding more specific feedback content and language selection, this can be input into training sessions or PBL tutor refreshes conducted by the faculty.

Effective feedback in PBL requires clarity, timeliness, and a strong relationship between students and tutors. Institutions should train tutors to deliver high-quality feedback and consider incorporating technology to provide timely and constructive feedback. This study offers insights for optimizing feedback practices in PBL to improve learning outcomes in medical education.

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