

Enhancing Medical Education: Perceptions and Challenges of Implementing Problem-based Learning at the Defence Services Medical Academy

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Abstract

Background: The transition from a traditional teacher-centred model to an active, student-centred approach requires substantial adjustments for both students and faculty. At the Defence Services Medical Academy (DSMA), the introduction of an outcome-based curriculum includes the adoption of Problem-Based Learning (PBL), a method that may pose challenges for learners and facilitators due to unfamiliarity with autonomous learning and facilitation roles.

Objective: This study aimed to explore the perceptions of students and faculty members regarding the implementation of PBL within DSMA's Phase I curriculum and to identify perceived benefits, challenges, and recommendations for optimizing its use.

Methods: A qualitative research design with a constructivist paradigm was employed. Purposive sampling identified six students and six faculty members involved in PBL activities. Two focus group discussions (FGDs) were conducted. Data were analysed manually using thematic analysis to extract emergent themes reflecting participants' experiences and views.

Results: Students reported that PBL improved critical thinking, collaboration, and independent learning, especially through diverse triggers and real patient cases. Facilitators noted challenges such as inconsistent student preparedness, limited foundational knowledge, and dominance of content experts during discussions. Both groups emphasized the importance of skilled facilitators in supporting inquiry, communication, presentation, and problem-solving skills. Recommendations included clearer trigger design, pre-session materials, enhanced facilitator training, and adding formative assessments to strengthen PBL implementation.

Discussion: Findings indicate that PBL supports the development of essential competencies aligned with DSMA's outcome-based curriculum but requires structural and pedagogical adjustments for optimal implementation. Strengthening facilitator capacity, improving student readiness, and enhancing resource quality may address identified obstacles. The shared

perceptions underscore PBL's potential to produce reflective, analytical, and collaborative learners prepared for clinical practice.

Conclusion: PBL is perceived as a valuable and effective educational strategy at DSMA, fostering critical thinking, teamwork, and self-directed learning. Enhancements such as high-quality triggers, real-world case integration, and systematic facilitator development may further strengthen its impact on medical education within the institution.

Keywords: Problem-based learning (PBL), Outcome-based curriculum (OBC), Student-centred learning, Medical education & Facilitator challenges

1. Introduction

The implementation of Outcome-Based Education (OBE) in medical education has not only revolutionized the way knowledge is imparted and skills are developed but also transformed the overall educational experience for students worldwide (Macayan, 2017). This student-centered approach signifies a paradigm shift from traditional teaching methods, where the emphasis was largely on rote memorization and passive learning. Instead, OBE places paramount importance on defining specific learning outcomes and cultivating the essential competencies required for medical professionals to excel in their careers (Miles et al., 2012). This transition from a passive, teacher-driven approach to an active, student-driven approach requires a fundamental change in the mindset and learning strategies of both students and faculty members. Students must adapt to a more independent and proactive learning style, where they engage in critical thinking, problem-solving, and reflective practices.

Similarly, faculty members face their own set of challenges in adjusting their teaching methods to align with the outcome-based curriculum. Aligned with this progressive educational philosophy, the DSMA in Yangon, Myanmar demonstrated its commitment to advancing medical education by embracing an outcome-based integrated curriculum in 2017. By aligning the curriculum with specific learning outcomes, DSMA strives to create a dynamic and engaging learning environment that fosters critical thinking, problem-solving abilities, effective communication, and teamwork skills. Through this approach, DSMA seeks to prepare its graduates to provide high-quality healthcare services that meet the evolving needs and challenges of the population they will serve.

To address these challenges, DSMA must invest in comprehensive orientation programs, educational resources, and ongoing faculty development initiatives. By providing the necessary support and training, DSMA can empower both students and faculty members to navigate the transition successfully and fully embrace the principles of outcome-based education. Moreover, the adoption of PBL within the newly implemented Phase I curriculum at DSMA may encounter resistance and obstacles from academic faculty members who are more familiar and comfortable with conventional teaching methods. PBL is a dynamic and learner-centered educational

approach that has gained global recognition and is widely employed in medical education (Ungaretti et al., 2015).

At the heart of PBL is the belief that students learn best when actively engaged in authentic, real-world problems that require them to apply their knowledge, think critically, and collaborate with their peers (Martyn et al., 2014). By immersing students in the active and self-directed learning process, PBL empowers them to take ownership of their education, fostering a sense of curiosity, autonomy, and responsibility for their own learning journey (Swargiary, 2023). Currently, PBL is particularly relevant in the context of the newly implemented Phase I curriculum at DSMA. PBL provides an opportunity for students to take ownership of their education, fostering critical thinking, problem-solving, and collaborative learning (Samson, 2015). However, the implementation of PBL may pose challenges in the context of DSMA. The new curriculum may require significant changes in teaching and learning strategies among faculty, many of whom may be more comfortable with traditional teaching approaches. Additionally, as discussed by Bature, 2020, the transition to a student-centred approach may be challenging for students who are accustomed to the traditional teacher-centred approach. Several studies have emphasized the importance of a supportive learning environment, a well-structured curriculum, and skilled facilitators for the successful implementation of PBL (Hung et al., 2019). These elements play a pivotal role in enabling students to engage effectively in the PBL process, fostering their growth and development as self-directed learners. However, it is important to acknowledge that in the context of DSMA, the availability of such resources may present certain limitations and challenges.

Therefore, this study aims to investigate and analyze the perceptions of both students and faculty regarding the utilization of PBL in the newly implemented Phase I curriculum at DSMA. The significance of this study lies in its potential to provide valuable insights into the challenges associated with implementing PBL within a recently introduced outcome-based integrated curriculum. The findings will contribute to the development of effective pedagogical strategies tailored to medical education at DSMA. Moreover, these insights will enrich the ongoing global discussion on effective pedagogical strategies for medical education, benefiting educational institutions worldwide.

2. Method

This study is the qualitative approach with a constructivist paradigm where meaning is socially constructed through the participants involved in the phenomenon of PBL sessions, in which ontology is multiple realities and epistemology is subjective. The qualitative thematic analysis approach was applied in this study to uncover the social process of the students and faculties communicating with one another to generate shared meaning about PBL (Creswell & Clark, 2007).

2.1 Setting and educational context

PBL was introduced in the current integrated curriculum of the Phase I MBBS (Foundation Year, Year I and II) of DSMA in January 2011. The students and faculty of the Phase I program have experience with PBL to some extent and they were the participants of the study.

2.2 Sampling strategy, sample size, selection and recruitment

The purposive sampling method was used and participants were selected according to the judgment of the researcher. Students (n=6), and faculties (n=6), who are involved in the PBL process of the Phase I MBBS program of DSMA were selected.

2.3 Data collection procedures

Two focus group discussions were conducted with students and faculty. The purpose of the study was explained to the participants before focus group discussions. While introducing the focus group, the facilitator identified himself and the Note Taker and provided the Sign-In Sheet with a few brief demographic questions (age, gender, and academic year). The first questions are more open-ended to help participants relax and get used to the setting of exchanging ideas and opinions with others. The facilitator focused on the primary questions in the FGD guide, promoting discussion that discloses the views and opinions of the participants concerning the use of PBL in DSMA.

2.4 Data analysis procedures

In this study, explanations, patterns, and ideas aroused from the data, but no preconceived categories will be used. Data analysis procedures was performed manually to develop code and categories for theory construction (Creswell & Clark, 2007).

2.5 Ethical Considerations

The study was done according to the guidelines published by the Ethical and Research Committee of DSMA. Participation in this study is completely voluntary. Both students and faculties from the Phase I MBBS program have the option of refusing to participate. They have the right to withdraw at any moment throughout the study procedure, even if they previously accepted. Participants are provided with a written consent form detailing the study's purpose, procedures, risks, and benefits, and their rights. They sign this document to indicate their agreement to participate.

3. Results

3.1 Students' Perceptions

Theme 1: Effectiveness of Problem-Based Learning (PBL)

Participant A emphasized the effectiveness of PBL based on their extensive experience with approximately 30 PBL sessions during their academic journey. "In my experience, having gone

through approximately 30 PBL sessions during my student life, I find that PBL is an incredibly effective learning method, especially for students in the DSMA field”. The key advantages which participant B highlighted included the ability to explore subjects not covered in traditional classrooms, aligning learning with the curriculum, and delving into supplementary literature. This approach facilitated a comprehensive understanding of interconnected subjects like Anatomy and Physiology. “One of the significant advantages of PBL is that it allows us to explore subjects that might not have been covered in the regular classroom setting. PBL enables us to align our learning with the curriculum and even delve into literature not typically found in textbooks. For example, we can study Anatomy and Physiology together, recognizing the connections between these subjects and gaining a more comprehensive understanding”.

Theme 2: Cognitive Impact of PBL

Participant C noted that PBL positively impacted their thinking skills. The collaborative nature of PBL fostered teamwork and honed critical and creative thinking abilities. However, a challenge identified was the occasional familiarity with the problems or triggers presented in PBL sessions, potentially impeding the depth of the learning experience. To enhance PBL, the participant recommended incorporating real patient cases and utilizing engaging mediums such as PowerPoint presentations or videos for triggers.

“Moreover, PBL has a positive impact on our thinking skills. It challenges us to come up with various solutions and apply diverse knowledge to solve problems effectively. The collaborative nature of PBL promotes teamwork and helps us develop our ability to think critically and creatively”.

Theme 3: Role of Facilitators in PBL

All the participants acknowledged the pivotal role played by facilitators at DSMA in ensuring the effectiveness of PBL sessions. “The facilitators at DSMA play a crucial role in making PBL sessions effective. They guide us in our thinking process and encourage us to develop our presentation skills, making the overall learning experience more enriching”.

Theme 4: Skill Development through PBL

Communication Skills: Participant B highlighted that PBL significantly enhanced their communication skills. Through group discussions and interactions, they learned to articulate thoughts clearly and effectively. This extended to presenting ideas, considering diverse perspectives, and active listening – all of which contributed to a sense of teamwork and eased communication of complex concepts. “Firstly, PBL significantly enhances our communication skills. Through group discussions and interactions with peers, we learn how to articulate our thoughts clearly and effectively. Presenting our ideas, sharing different perspectives, and listening to others' viewpoints in a collaborative environment foster a strong sense of teamwork

and the ability to communicate complex concepts with ease. These communication skills not only benefit us within the PBL sessions but also extend to other aspects of our academic and professional lives.

Thinking Skills: Participant E emphasized that each session presented new and challenging problems, necessitating thoughtful analysis and critical reasoning. This capacity for critical thinking proved invaluable for addressing complex real-world issues beyond the academic sphere. “Secondly, PBL plays a pivotal role in honing our thinking skills. In each session, we encounter new and challenging problems that require thoughtful analysis and critical reasoning. By considering various approaches and evaluating the information we receive, we cultivate our ability to think analytically and develop innovative solutions. This practice of thinking critically becomes a valuable asset as we tackle complex real-world issues beyond the academic setting.

Learning Skills: Engagement in solving clinical problems during PBL sessions prompted participants to seek out information from a variety of resources, including textbooks, research papers, and online materials. This not only deepened understanding but also fostered a habit of continuous and independent learning – a crucial skill for staying current in the rapidly evolving DSMA field. “Moreover, our learning skills undergo significant improvement through PBL. As we engage in solving clinical problems presented during these sessions, we are prompted to seek out relevant information from a wide range of resources, such as textbooks, research papers, and online materials. This process not only deepens our understanding of the subjects at hand but also fosters a habit of continuous and independent learning, which is essential for staying up to date in the ever-evolving DSMA field.”

Presentation Skills: PBL provided an effective platform for refining presentation skills. As participants worked together to find solutions and analyse case studies, they frequently had to present their findings to the group. These skills proved invaluable for communicating research and findings in professional settings and contributing to the broader scientific community. “PBL serves as an effective platform for refining our presentation skills. As we work together to find solutions and analyse case studies, we are often required to present our findings and conclusions to the group. This regular practice of presenting not only boosts our confidence in public speaking but also helps us develop the ability to convey complex ideas concisely and persuasively. These presentation skills are invaluable as we communicate our research and findings in professional settings and contribute to the broader scientific community”.

Through PBL, participants experienced marked improvement in communication, thinking, learning, and presentation skills. These essential skills not only elevated academic performance but also established a robust foundation for future careers in the DSMA field. To enhance the effectiveness of PBL, the incorporation of real patient cases and interactive triggers like videos was suggested. Overall, PBL left a positive imprint on the participant's perception of learning and significantly contributed to their development as a student in the DSMA field.

3.2 Faculty Perception

Theme 1: Challenges in PBL Facilitation

The facilitator acknowledges that while PBL sessions at DSMA are engaging, certain challenges exist. One challenge involves ensuring that students have adequate background knowledge before initiating a session. This is crucial for their full understanding and participation. To mitigate this, the facilitator plans to provide pre-session materials or introductory sessions to familiarize students with relevant concepts.

“I’ve also encountered some challenges that need addressing. Sometimes, I find that students are not actively participating or speaking up, and I end up leading most of the discussion. To tackle this, it’s important to encourage and create opportunities for all students to contribute and take on active roles in the discussions.” Another challenge arises when the facilitator, often a content expert, inadvertently leads the session, potentially hindering student-driven discussions. The facilitator recognizes the importance of clarifying their role, emphasizing facilitation over direct teaching, to encourage students to take ownership of their learning. Regular facilitator meetings are suggested to ensure alignment in approach and successful PBL implementation.

Theme 2: Opportunities and Benefits of PBL

The facilitator identifies several opportunities presented by PBL. One significant opportunity is the enhancement of students' thinking skills, particularly critical thinking, analytical reasoning, and creative problem-solving. Furthermore, PBL is viewed as a platform for honing problem-solving abilities. By grappling with authentic problems, students learn how to identify key issues, gather relevant information, and generate innovative solutions. The facilitator also sees an opportunity to improve students' literature search skills. “While PBL focuses on active learning and problem-solving, some students may need additional motivation to fully engage with the process. To address this, I’m considering introducing formative assessments or periodic progress checks to provide feedback and incentivize active participation

Theme 3: Recommendations for Effective PBL Implementation

To address the challenges and capitalize on the opportunities presented by PBL, the facilitator offers specific suggestions:

Clear Background Information: Providing clear and concise background information to students before initiating a PBL session is essential to ensure they have the necessary context for effective engagement with the problem.

“The trigger should be thoughtfully written to provide enough information for students to begin their investigation but also leave room for exploration and further discovery. By striking the right balance between guidance and open-endedness, we can create a stimulating learning environment that challenges students to think critically and develop their analytical skills”.

Facilitator Role Clarification: Facilitators should be mindful of their role as facilitators rather than content experts. Encouraging student-led discussions, promoting active participation, and providing guidance when necessary are seen as crucial in empowering students to take ownership of their learning.

Regular Facilitator Meetings: Regular meetings and discussions among facilitators are suggested for sharing experiences, addressing challenges, and refining the PBL approach to meet the specific needs of the Phase I curriculum.

Formative Assessments and Feedback: Incorporating formative assessments and feedback loops throughout the PBL process can help students track their progress, receive guidance, and stay motivated. This approach aims to ensure continuous support and encouragement for students to develop their thinking skills, problem-solving abilities, and literature search skills.

Overall Participant Perceptions on Problem-Based Learning (PBL)

In this thematic analysis of participant perceptions on PBL at DSMA, two distinct themes emerged: "Advantages and Disadvantages" and "Challenges and Opportunities." Participants provided valuable insights into the effectiveness of PBL in enhancing critical thinking, problem-solving, and collaborative learning skills.

Theme 1: Advantages and Disadvantages of PBL

Participants highlighted several advantages of PBL, including improved literature search skills, active participation, and enhanced problem-solving abilities.

“One major advantage is the improvement in students' literature search skills. PBL encourages students to explore and analyse a variety of resources to gain a deeper understanding of the problem at hand”.

“PBL enhances students' problem-solving skills. By presenting authentic and challenging scenarios, PBL encourages students to think critically, analyse information, and apply their knowledge to real-world situations.”

The collaborative and interactive nature of PBL was noted as particularly beneficial for students' academic and professional development. However, some limitations were also acknowledged. These included challenges related to foundational knowledge, the absence of summative assessments, and variations in student engagement levels.

Theme 2: Challenges and Opportunities in PBL Implementation

Participants identified challenges in PBL facilitation, emphasizing the need for adequate background information and a clear facilitator role. They recognized opportunities in PBL, such as the enhancement of critical thinking and problem-solving skills, as well as improved literature search abilities. Recommendations were provided to address challenges, including the provision

of pre-session materials, clarification of facilitator roles, and the establishment of regular facilitator meetings.

“However, there are some disadvantages and challenges that I have encountered or observed regarding the use of PBL. One challenge arises when students lack the necessary foundational knowledge to tackle the given problem. In such cases, their motivation may be low, as they struggle to connect the problem to their existing knowledge base. It becomes important to provide scaffolding and support to help Students Bridge the gap between their current knowledge and the requirements of the problem”. In conclusion, the thematic analysis revealed a comprehensive understanding of participant perspectives on PBL. The advantages of PBL in promoting active learning and critical thinking were acknowledged, along with the challenges faced in its implementation. Participants offered valuable recommendations to maximize the benefits of PBL and mitigate potential limitations. This analysis provides valuable insights for educators and institutions seeking to optimize the effectiveness of PBL in the DSMA curriculum.

4. Discussion

The findings of this qualitative study provide valuable insights into both students' and faculty members' perceptions of PBL at DSMA. These perspectives shed light on the effectiveness of PBL in the context of medical education and offer recommendations for its enhancement.

4.1 Student's Perception

Effectiveness of Problem-Based Learning (PBL)

Participant A's extensive experience with approximately 30 PBL sessions highlights the perceived effectiveness of this approach, particularly for students in the DSMA field. The ability of PBL to allow exploration of subjects beyond the traditional curriculum is a significant advantage. This finding aligns with previous research emphasizing PBL's capacity to foster a comprehensive understanding of interconnected subjects like Anatomy and Physiology (Torre et al., 2016).

Cognitive Impact of PBL

Participant A's observation of the positive impact on thinking skills is consistent with the literature, which suggests that PBL promotes critical thinking and problem-solving abilities (Hmelo-Silver & Eberbach, 2012). The collaborative nature of PBL, as noted by Participant A, aligns with studies highlighting its role in fostering teamwork and honing critical and creative thinking abilities (Vernon & Blake, 1993).

Role of Facilitators in PBL

The acknowledgment of the pivotal role of facilitators at DSMA in ensuring the effectiveness of PBL sessions aligns with existing literature (Azer, 2003). Facilitators play a crucial role in

guiding students' thought processes and encouraging the development of presentation skills. This finding underscores the importance of skilled facilitators in optimizing the PBL experience.

Skill Development through PBL

Participant B's emphasis on the significant enhancement of communication skills through PBL is supported by research indicating that PBL promotes effective communication and teamwork (Neville, 2008). Moreover, Participant B's recognition of PBL's instrumental role in honing thinking skills aligns with the literature highlighting its impact on critical thinking and analytical reasoning (Hmelo-Silver & Eberbach, 2012). The process of considering various approaches and evaluating information fosters analytical thinking and innovative solutions, which are crucial skills for addressing real-world issues.

Engagement in solving clinical problems during PBL sessions prompts independent learning and resource exploration, contributing to continuous and independent learning skills. This finding supports the idea that PBL encourages self-directed learning and information retrieval (Leary et al., 2019). PBL provides an effective platform for refining presentation skills, aligning with previous research indicating that collaborative learning environments enhance presentation abilities (Liguo Yu & Raman Adaikkalavan, 2016). The regular practice of presenting findings fosters confidence in public speaking and the ability to convey complex ideas persuasively. In summary, the multi-faceted and far-reaching impact of PBL on skills development is a significant finding of this study. The enhancement of communication, thinking, learning, and presentation skills not only elevates academic performance but also establishes a robust foundation for future careers in the DSMA field. The recommendation to incorporate real patient cases and interactive triggers aligns with strategies to further optimize PBL (Oon Seng Tan, 2003).

4.2 Faculty Perception

Challenges in PBL Facilitation

The acknowledgment of challenges in PBL facilitation highlights the need for proactive measures. Providing pre-session materials or introductory sessions to address potential gaps in students' background knowledge is a valuable strategy.

Opportunities and Benefits of PBL

The identification of opportunities, including the enhancement of thinking skills, problem-solving abilities, and literature search skills, reinforces the potential benefits of PBL. The suggestion of formative assessments or periodic progress checks aligns with strategies to motivate and track students' engagement in PBL (Pu et al., 2019).

Recommendations for Effective PBL Implementation

The specific suggestions provided by the facilitator are practical steps to address challenges and maximize opportunities. Clear background information, facilitator role clarification, regular facilitator meetings, and formative assessments with feedback loops are essential strategies for successful PBL implementation.

Overall Participant Perceptions on PBL

The thematic analysis of overall participant perceptions provides a comprehensive understanding of the advantages and challenges associated with PBL. The highlighted advantages in literature search skills and problem-solving abilities align with existing research (Oon Seng Tan, 2003). The acknowledgment of challenges related to foundational knowledge underscores the importance of scaffolding and support for effective PBL implementation.

5. Conclusion

This study highlights the positive perceptions of both students and faculty toward Problem-Based Learning (PBL) at DSMA, emphasizing its role in strengthening critical thinking, teamwork, communication, and independent learning. Students found PBL engaging and beneficial for integrating theoretical knowledge with real-world clinical contexts, while faculty recognized opportunities for improving analytical and problem-solving skills. Despite these benefits, challenges such as varying student preparedness, limited foundational knowledge, and the need for clearer facilitator roles remain. Addressing these issues through better-designed triggers, enhanced facilitator training, pre-session support, and formative assessments can significantly strengthen PBL implementation. Overall, PBL demonstrates strong potential as an effective learner-centered strategy for preparing competent, reflective, and adaptable future healthcare professionals.

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