Problem-Based Learning as a Teaching Method:
An Experience at University Malaysia Terengganu (UMT)

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Problem-Based Learning (PBL) stands as a pedagogical approach that stimulates students' engagement by immersing them in learning experiences centred around real-world problems or scenarios. Under the guidance of tutors, students work in small groups to identify and resolve issues, drawing insights from various sources such as notes, books, journals, newspapers, and online resources. This paper aims to share the practical application of PBL in both compulsory and elective courses at the University Malaysia Terengganu (UMT). The purpose of this paper is to integrate Problem-Based Learning (PBL) in their instructional planning and manifest during the facilitation process of PBL as a teaching method. The experience of implementing PBL was witnessed in courses like "Islam and Leadership" with 49 students, Arabic language courses with 16 students and the compulsory course "Philosophy and Current Issues" with around 1200 students. This approach, facilitated by lecturer team, promotes collaborative learning activities, discussions, teaching, observation, and reflective practices. Student-centric PBL offers a positive impact on group collaboration, thereby improving the overall teaching and learning quality.

INTRODUCTION

Initially developed at McMaster University for medical training, Problem-Based Learning (PBL) has transcended disciplinary boundaries, becoming a versatile teaching methodology (Virginie Servant-Miklos, 2020; Jaganathan, S., Ramesh, M., & Krishnan, R., 2020). PBL provides an experience for students

combining intellectual engagement and practical engagement. The learning process that students go through encourages them to conduct deep investigative efforts and make decisions driven by real-world challenges. Therefore, the PBL approach encourages groups of students to work together to share the findings of the investigation by sharing the findings through presentations to provide solutions to the problems faced. They believe that the chosen problem-solving approach is the best choice after conducting an investigation process through trusted sources that highlight the researcher's writings, newspapers, online databases and organizations involved.

PBL is an alternative teaching approach suitable for increasing active learning engagement, stimulating critical and creative thinking, encouraging self-regulated learning, giving students space to improve social relationships through discussion and also involvement in field work, as well as trying to adapt to learning something in real life. The foundational PBL model, devised by Barrows (1996), incorporates six key elements: 1. Student-centeredness; 2. Small-group learning; 3. Tutor facilitation; 4. Early introduction of authentic problems; 5. Use of problems to acquire essential knowledge; 6. Problem-solving to foster guided learning and discovery of novel information.

Consequently, the PBL framework empowers learners to recognize educational gaps and grapple with complex problems. This framework goes beyond a mere "problem-solving" mechanism, as the ultimate learning goal encompasses more than just issue resolution. Learning materializes through self-directed exploration within collaborative group discussions, ultimately leading to interdisciplinary knowledge synthesis, collaborative aptitude honing, and skill refinement. The merits of PBL lie in its departure from conventional lecture-based instruction and its capacity to establish a unified knowledge foundation that melds diverse subjects. PBL, in addition to enhancing information retention, nurtures lifelong learning skills and offers real-world exposure. This study serves as a resource for students, educators, universities, and peers seeking to understand and effectively implement PBL, nurturing critical thinking among students. The study addresses two key research queries:

1. How do educators integrate Problem-Based Learning (PBL) in their instructional planning?
2. What forms of PBL integration manifest during the facilitation process?

PROBLEM-BASED LEARNING (PBL)

The tutorial phase of PBL underpins the construction of knowledge, as students navigate learning while tackling posed challenges. Initiating discussions activates their existing knowledge, facilitating interaction and strengthening interpersonal ties within small groups. This process fosters the acquisition of novel knowledge through inquiry-driven approaches to solve real-world problems (Greeno et al., 1996). For instance, the Philosophy and Current Issues course exposes students to societal dilemmas stemming from varying ideologies. Consequently, learners engage inquiry skills aligned with National Principles, National Education Philosophy, and well-being principles. Similarly, the Islam and Leadership course introduces students to interpersonal skills and inquiry-based practices to align leadership paradigms with shariah principles. Thus, the PBL process cultivates a culture of learning, reinforcing social interaction through cognitive skill utilization. This perspective acknowledges that social inquiry and learning practices augment learners' proficiency as capable and informed participants in the educational journey (Lampert, 2001).

PBL fundamentally represents a self-directed learning model involving problem-solving. It stimulates students to explore and resolve challenges, thus enriching their innovative and creative cognition. The advantage lies in fostering skill mastery via the problem-solving trajectory, which can be executed collaboratively and participatively. From both observational and practical standpoints, PBL effectively engages students during instructional sessions. Furthermore, according to researchers' insights, PBL thrives by harnessing students' diverse talents and skills. Students with varying abilities contribute diverse perspectives and creativity to task execution. PBL's self-directed approach empowers learners to orchestrate activities and shoulder greater responsibilities. The educator's role transforms into that of a facilitator, guiding and nudging students towards autonomous learning. Additionally, PBL proves adept at fostering critical, innovative, and self-assured learners. As roles alternate, each student emerges as an active contributor within the societal context. This approach also sharpens collaborative competencies within

groups, enabling the exchange of viewpoints and ideas for issue resolution. Active discourse streamlines knowledge organization and its alignment with challenges. Learners adeptly structure interconnected themes based on priority and formulate queries for group discussions.

This article delves into the essence of learning within PBL and scrutinizes empirical evidence substantiating its efficacy. PBL's pedagogical method enhances peer interaction, transcending conventional learning formats. Learners effortlessly engage with group members to comprehend the learning method holistically. Notably, the PBL approach offers a platform for struggling or less proficient students to interact more closely and cordially with peers or group members. Evidence highlights PBL's potential to foster flexible comprehension and lifelong learning competencies, thereby intensifying learning motivation compared to traditional methodologies. PBL emerges as a solution, engendering fresh ideas and personal growth.

TUTORIAL PROCESS OF PROBLEM-BASED LEARNING

The tutorial phase within the Problem-Based Learning (PBL) framework stands as a pivotal facet, facilitating intricate learning processes rather than dispensing content knowledge. All students contribute to problem-centric discussions and coursework, taking on varied roles within small groups, including chairperson, secretary, presenter, timekeeper, or observer. The educator, functioning as a facilitator, steers thinking processes and provides metacognitive support, thereby ensuring equitable participation. The facilitator rotates among groups, adjusting time allocations based on group needs. Progress evaluation becomes dynamic, achieved through poster sheets or discussion outcomes presented via posters or shared discussion results.

In specific contexts, students adopt specific roles to enrich discussion activities, interviews, presentations, and Questions and Answer (Q&A) sessions. Group members align tasks as presentation coordinators, photographers, researchers, slide preparers, question scriptwriters, and evaluators of content for presentation slides and reflection reports. Broadly, the learning journey commences with defining the educator or facilitator's roles, including: i. Fostering a stimulating and challenging learning environment, ii. Guiding the PBL process instead of delivering micro-lectures, iii. Attentively listening to students' contributions, identifying learning hurdles and enjoyment within teams, iv. Selectively intervening in discussions, informed by attentive listening and observation, v. Posing questions that stimulate critical and creative thinking, vi. Soliciting evidence and sources for acquired information from students, vii. Encouraging the synthesis of theory and practice, viii. Instigating debates around pivotal topics, ix. Assigning students the responsibility of high-quality self-directed learning, x. Guiding students in reflecting on learning, skill development, and team dynamics.

An inherent PBL advantage lies in the fusion of new ideas or concepts with pre-existing ones before making informed decisions. Thus, past experiences substantially inform decision-making. Continual exploration of new materials by students consolidates ideas within groups. Consequently, PBL seamlessly unifies pedagogy with instructional techniques. Effective communication stands as a nurtured skill, accentuated through problem-based tasks that provide holistic insights into real-world contexts. Furthermore, PBL accentuates the inquiry process, whereby students strive to resolve challenges through predetermined processes.

PROBLEM-BASED LEARNING TEACHING APPROACH

The implementation of both elective and compulsory courses at the Centre for Fundamental and Continuing Education (PPAL), Universiti Malaysia Terengganu (UMT)) involves some educators who play the role of facilitators when implementing Problem-Based Learning (PBL). This approach immerses students in problem-solving learning experiences, with a focus on real-world issues. PBL transcends mere problem-solving by encouraging students to not only solve problems but also to delve into the root causes of these issues and propose effective solutions.

In this context, five distinct teaching methods have been introduced within UMT's for elective and compulsory courses:

    a. **Preparation for Teaching and Learning.** The foundation of PBL teaching and learning resides in meticulous preparation. Establishing an engaging learning environment is paramount, ensuring that students are primed for effective learning experiences. However, the Covid-19 pandemic led to a paradigm shift from in-person to online classes, thereby challenging the preparation process. Educators and students alike transitioned to remote learning environments. Despite this shift, some students chose to reside in dormitories due to unsuitable home learning conditions. Educators had to adeptly navigate the realm of online teaching, leveraging essential tools like cameras, microphones, updated educational apps, and robust internet connectivity. Students also needed to adapt mentally and physically to grasp the conveyed content. Instructors extended advice and shared experiences to facilitate students' adjustment to this new normal, particularly in the context of online learning.

    b. **Self-Directed Learning within Small Groups.** This phase introduces self-directed learning through small group interactions. Each group designates a leader, note-taker, presenter, timekeeper, and facilitator, with roles rotating among members. Various tasks are systematically assigned to students. The group leader assumes the responsibility of ensuring allocated tasks are executed effectively, involving every group member in collective activities. The note-taker documents discussion details, strategies, and unresolved points. The presenter creates an overall report on the discussion's outcome and oversees the compilation of the entire assigned task. The facilitator role centres on ensuring clear comprehension among group members and sourcing pertinent materials.

    c. **Divided Tasks and Assessment.** Students engage in segmented tasks, including reflection reports (30%), presentations (30%), quizzes (10%), and a final examination (30%) – or 40% if a quiz assessment is absent. Collectively, these contribute to a full score of 100%. Assignments, encompassing reports/discussions, presentations, and group participation, are assessed using rubrics. To ensure systematic PBL implementation, an array of documents is crafted to document the teaching and learning journey, encompassing Task Instruction Forms (Group), Learning Process Forms (Group), Group Evaluation and Self-Assessment Forms (Individual), and Task Marking Rubrics.

IMPLEMENTATION OF THE PROBLEM-BASED LEARNING APPROACH

Problem-Based Learning (PBL) is a teaching methodology where students grapple with intricate, open-ended challenges to foster learning. These challenges are rooted in real-world matters, fostering student learning through PBL-aligned principles and concepts. As PBL emphasizes problem-driven instruction and learning, the quest for solutions to societal problems stands as a focal point. Rather than merely transmitting knowledge, educators facilitate the learning journey. The overarching goals of PBL encompass cultivating: 1) adaptable knowledge, 2) adept problem-solving skills, 3) self-guided learning prowess, 4) effective collaborative aptitude, and 5) intrinsic motivation. PBL's instructional strategies nurture critical thinking, problem-solving abilities, communication prowess, and a dedication to lifelong learning.

PBL's lineage finds grounding in supporting experiential education, fortified by psychological research and theories that endorse problem-solving experiences for holistic content acquisition and thinking strategy refinement. Problem-Based Learning entails students learning through guided problem-solving. Within PBL, learners confront multifaceted issues bereft of singular right answers. Collaborative groups discern the requisite learning to address these problems, undergoing self-guided learning (SDL). Thereafter, learners apply their newfound insights to solve the problem, subsequently reflecting on their newfound understanding and the efficacy of their approaches.

This process involves various stages, beginning with the formation of small groups to facilitate focused learning activities. Each group's activities, learning goals, and the allocated timeframe for problem-solving activities are established. Students then pinpoint problems by analysing provided scenarios. If students

possess information, they are expected to propose solutions; otherwise, they delve into research via diverse resources. Task distribution within groups is regarded as a learning experience, with group members undertaking roles of note-taker, reporter, facilitator, and more.

As part of the learning structure's preparation, teaching methods harmonious with the PBL framework are delineated. All learning topics for the semester are listed, accompanied by a segmentation into real-world issues related to the course's content. If a discussion theme resonates with contemporary concerns, students engage in group discussions concerning it. Subsequent solutions are shared with the broader group, tying in concepts taught in class. Students are encouraged to address societal challenges using methods taught by instructors.

The progression of PBL involves:

    a. **Formation of Small Groups.** Students are grouped to facilitate learning within smaller settings. The PBL process commences by forming groups comprising 7 to 10 members. This phase establishes activities, learning objectives, and the timeframe for problem-solving activities.

    b. **Problem Identification.** Students analyse and identify problems, with distributed problem scenarios prompting them to propose solutions. If students possess information, they suggest solutions; otherwise, they engage in research using various data sources. Students work collaboratively within groups, referring to:

    c. **Group Discussions.** Small student groups delve into identifying the underlying causes of a problem. Task allocation among group members becomes a learning experience and a means to achieve learning objectives and teaching goals.

    This teaching approach entails educators reflecting on "previous learning," engaging students in essay-writing centred on how specific problems arise from contemporary knowledge. The goal is to foster reflection and promote the exchange of thoughts on previously acquired knowledge in the context of pertinent issues.

    d. **Exploration and Research for Pertinent Materials.** Students embark on research-based discussions to uncover materials related to the current issues addressed in their assignments. Any pertinent reading materials serve as references if they correlate with the addressed issues. Each explored material should offer evidence linking the addressed problems to course content. The exploration process involves steps to identify solutions and select optimal methods for presentation.

EXPLORE DIFFERENT SOLUTIONS

The students will go through a learning experience together to find a solution to the selected issue. After discussing the issues faced based on the topics given in each course, the problem- solving process can be formulated in the following activities;

- Students will discuss the issues faced by finding critical problems faced without clear solutions.
- Students try to relate the issues discussed with the learning topic to find the compatibility of the problem with the solution in the topic studied. For example, students try to relate real problems to ideologies studied in Philosophy and current issues courses, or to leadership models in Islam and leadership courses.
- Students will always be in contact with lecturers and other friends to get enlightenment to solve problems. Lecturers play a more role as facilitators to guide students to discover the main problems and provide guidance on how to solve the problems faced by students.
- Students are also given time for information gathering, strategy formulation and creative thinking.
- This learning process has given students the opportunity and experience to foster a comfortable, relaxed and safe learning environment that is conducive to solving problems and thinking independently.

OPTIMAL SOLUTION SELECTION AND PRESENTATION

The learning process ends by determining the best solution to the problem to be presented to the other groups of students in the class. Each presenter is required to explain the concept of the title related to the problem at hand, explain the related concept and discuss the results under the guidance of the lecturer who acts as a facilitator. In relation to that, the following are the steps taken by the student group to find solutions to face issues or problems faced through features such as

- Students try to relate the real issue with the learned concept referring to the learning topic. For example, economic issues try to be linked to the ideological influence of capitalism or socialism.
- Students try to explain the connection between economic problems and ideology learned by providing facts based on the search for information obtained from writing articles, newspapers, interviews with industry parties and so on.
- Presentation activities encourage students to share information from one group with another group which reveals a desire to know and solve problems about the discussed issues related to the learning topic.
- This activity can also attract the attention of other students to understand the best solution to the issue discussed and then the solution is chosen according to the method shown.

METHODOLOGY

This study uses a qualitative approach, by conducting interviews and observations as data collection methods. Data was collected from 1330 students of various disciplines at UMT who followed elective courses and compulsory courses. The course chosen for this study is MPU 3142 Philosophy and Current Issues as a compulsory course with a total of 1200 students, and two elective courses such as NCC3503 Islam and Leadership with 114 students, and an Arabic language course with 16 students, at the Centre for Fundamental and Continuing Education (PPAL), UMT.

RESULTS AND DISCUSSION

The findings of the study through the results of this interview show that from the students' perspective, teaching methods with a problem-based learning approach are more interesting and allow them to think more freely and contribute to problem-solving skills. The students are further exposed to learning activities that open up a wide space to work in groups, carry out discussion activities with peers and interact with the community in field work. Students also stated that the problem-based learning approach brings experience to exploration to generate creative and critical thinking on societal issues that are the topic of discussion among them.

The problem-based learning approach used by students to some extent gives learning problems to the level of self-learning of some students. Ertmer et al. (1996) conducted a qualitative study of veterinary students' approach to problem-based learning. Students with low self-regulation face challenges in adapting to the demands of problem-based teaching, showing different perceptions of its value. Students with high self-regulation prefer problem-based learning and focus on problem analysis and reflective processes. On the other hand, students with low self-control tend to acquire facts. The findings of the study revealed that students with low learning self-control may struggle with the demands of problem-based learning to understand the learning topics discussed in their class.

A problem-based learning environment is very different from a traditional teacher-directed classroom environment. PBL is seen as a vehicle for fostering problem-solving skills because it emphasizes active learning experiences that students should do. Accordingly, the implementation of PBL at the higher education level is an effort to connect university learning with the real professional world (Mohamad Termizi Borhan, 2014). The main principle of PBL that emphasizes the integration of disciplinary

knowledge and the development of high-level thinking skills by placing students in an active role in dealing with community problems in the real world.

CONCLUSION

A key limitation in effectively implementing Problem-Based Learning is the substantial number of students in a lecture hall. The assignment's dated nature leads to instances of plagiarism from online sources. Moreover, traditional lecturer-centred methodologies hinder students' engagement and comprehension of this core course.

Problem-Based Learning (PBL) emerges as a self-directed learning model, encouraging students to engage in problem-solving. PBL's emphasis on exploring and resolving problems fosters innovative and creative thinking. The approach's benefits lie in motivating students to acquire skills through the process of problem-solving, which can be undertaken collaboratively and participatively. Drawing from observations and PBL implementations, it becomes evident that PBL is adept at fostering student engagement during effective teaching and learning sessions. Additionally, PBL excels at harnessing the diverse talents and skills possessed by students, allowing various abilities to contribute ideas and creativity to assigned tasks. PBL's foundation in self-directed learning empowers students to plan activities and shoulder more responsibilities. The instructor's role transitions to that of a facilitator in student-centred learning. PBL is equally apt at nurturing critical, innovative, and confident students. As student alternate roles, each one becomes an active contributor to society. This method also strengthens collaboration within groups, facilitating the exchange of opinions and ideas for problem-solving. Active discussions serve to structure existing knowledge and connect it with the given problem. Students can also prioritize related topics and formulate questions for group discussions.

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