The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 5, 2025

THE RELATIONSHIP BETWEEN LEARNING STRATEGIES AND SELF-STUDY AMONG UNIVERSITY STUDENTS: A COMPARISON OF PROBLEM-BASED AND LECTURE-BASED LEARNING MODELS

Tamknat Ilyas[*1], Sidra Ali[2], Rabia Jawa[3], Rabia Majeed[4], Hamza Sana Minhas[5], Muhammad Subhan[6], Baseer Ashraf[7]

[*1,4]*Assistant Professor SHS UMT*
[2]*Lecturer SHS UMT*
[3]*Head of Department DPT SHS UMT*
[5,6,7]*Student DPT*

[*1]tamknat.ilyas@umt.edu.pk, [2]sidra.ali@umt.edu.pk, [3]rabia.jawa@umt.edu.pk, [4]rabia.majeed@umt.edu.pk, [5]labwolf312@gmail.com, [6]subhananwar597@gmail.com, [7]baseer7703@gmail.com

DOI: https://doi.org/10.5281/zenodo.15479778

Keywords
Problem based learning PBL, Lecture based, learning strategies, Word count of Abstract: 183, Word count of manuscript: 2100

Article History
Received on 13 April 2025
Accepted on 13 May 2025
Published on 21 May 2025

Corresponding Author: *
Tamknat Ilyas

Abstract

Problem-based learning (PBL) is a student centered approach that shifts the role of the teacher to the student. It is based on self-directed learning. PBL has been adopted in undergraduate and postgraduate medical education and LBL is the traditional learning method. The lectures have limitations such as passivity boredom, large group size. In this study we compared both of these methods and recorded the preference of medical students. A cross sectional study was carried through convenience sampling and 180 responses were taken from medical students of 3rd year and above. The survey response rates were in the favour of PBL, the study results revealed that the experimental group was considered PBL is effective in their learning process PBL methodology obtained a high level of satisfaction, especially among students. It was more effective than other more traditional (or lecture-based methods) at improving social and communication skills, problem-solving and self-learning skills.

Result: *PBL is an effective and satisfactory methodology for medical education. It is likely that through PBL medical students will not only acquire knowledge but also other competencies that are needed in medical professionalism.*

INTRODUCTION

For students in higher education, self-study is always an important part of the study program. Self-study can be approached in two ways, quantitatively and qualitatively (Doumen et al. 2014) Whether the time invested in learning plays an important role in academic success is still a point of debate (e.g., Doumen et al. 2014; Plant et al. 2005). However, there is clear evidence that learning strategies and activities are related to academic performance (Mega et al. 2014; Richardson et al. 2012; Vermunt 2005; Vermunt and Vermetten 2004). In turn, learning strategies might be influenced by the learning environment, because some learning environments intend to encourage high-quality learning (Mattick and Knight 2007; Vermunt 2007). Problem-based learning (PBL), a student-centered educational method, can be considered as a learning environment that aims to

stimulate effective learning. The present study will investigate whether PBL indeed stimulates effective learning strategies by comparing a PBL and a lecture-based environment with regard to students' study processes. In the last few decades, medical education has shifted from didactic teacher-centric approaches to interactive studentcentered learning [Ling, Y. U., et al. "Retention of basic science information by senior medical students." Academic Medicine, Vol. 83, No. 10, 2008, pp. 82-85.]. The outcome-based model of education focuses on the specific measurable learning outcomes that students will attain by the end of the program [Ramani, Subha, and Sharon K. Krackov. "Twelve tips for giving feedback effectively in the clinical environment." Medical Teacher, Vol. 34, No. 10, 2012, pp. 787-91.]. The learning environment and learning approaches play a significant role in achieving students learning outcomes [Biggs, John B. "From theory to practice: A cognitive systems approach." Higher Education Research and Development, Vol. 12, No. 1, 1993, pp. 73-85.]. The traditional subject-based curricula shifted towards an integrated system based approach that facilitates the construction of knowledge in a more contextual manner by connecting clinical disciplines with basic medical science subjects [Atwa, Hani S., and Enas M. Gouda. "Curriculum integration in medical education: A theoretical review."Intellectual Property Rights: Open Access, 2014.]. Problem- based learning was introduced at McMasters Canada in 1960s; a small group learning method that underpins the socio-constructivist learning theory that came up as one of the commonly applied student-centered learning method [Norman, G. T., and Henk G. Schmidt. "The psychological basis of problem-based learning: A review of the evidence." Academic Medicine, Vol. 67, No. 9, 1992, pp.557- 65.]. In problem-based learning, the scenario is used as a trigger and problems are used to enhance the knowledge and build the concepts while solving it in a group [Wood, Diana F. "Problem-based learning." BMJ, Vol. 326, No. 7384, 2003, pp. 328-30.].

Though the lectures have limitations such as passivity, boredom, large group size but still it forms a substantial part of the instructional method in the early years of the medical program [Brown, George, and Michael Manogue. "AMEE Medical Education Guide No. 22: Refreshing lecturing: A guide for lecturers." Medical Teacher, Vol. 23, No. 3, 2001, pp. 231-44]. Usage of illustrations and videos, effective questioning, creating a small activity within the lecture and summarizing at the end are some of the techniques that can engage learners in a more active manner [Snell, Yvonne Steinert, Linda S. "Interactive lecturing: Strategies for increasing participation in large group presentations." Medical Teacher, Vol. 21, No. 1, 1999, pp. 37-42.]. The physiotherapy profession is a more practical and functional evidence-based practice(P Panhale etal., 2017). PBL has been integrated into physiotherapy education. Some programmes follow completely integrated PBL curricula, transitional curricula, and a single course approach (Saarinen-Rahiika and Binkley, 1998). PBL provides positive benefits for both student education and clinical practice (Gunn et al., 2012) in the physiotherapy programme. However, there are advantages and disadvantages to these three different approaches (Saarinen-Rahiika and Binkley, 1998). The goal of PBL is to provide a clinical context for the acquisition of knowledge (Saarinen-Rahiika and Binkley, 1998). It is reported that health professionals spend less time reading clinical research (P Panhale et al., 2017).

The purpose of this study is to promote the development of critical thinking skills, problem-solving abilities, and communication skills. Typically students find it more enjoyable and satisfying. It encourages greater understanding. Students with PBL experience rate their abilities higher. PBL develops lifelong learning skill. PBL empowers students, builds important skills and prepare them for future clinical work settings.

2. METHODOLOGY:

Study design is Cross sectional. Data is collected from University of Management & Technology, University of Lahore, University of Central Punjab UCP and Superior University Lahore. Sampling Strategy is convenience method. Sample size is 180. Data Collection Tools used

are Inventory Learning style and 5 point Likert Scale.

Inclusion Criteria	Exclusion Criteria
• 3rd, 4th and final year students of universities • Health sciences students	• 1st and 2nd year university students. • Non-medical and others. • Students who are not willing to give data. • Students with psychological and physiological disabilities\issues.

Data Collection Procedure	Our participants were free to fill the questionnaire at any time they wanted. We asked for consent before we gave them the survey questionnaire. They knew the purpose and benefits of the research in they were supposed to be a part of. We only asked names in the survey questionnaire that's why we don't know the identities of the participants. We knew some of the participants but the data was collected anonymously so that the results should be appropriate. Our work is free of plagiarism and we tried to conduct this result appropriately and very accurately represented our results.
Analytical Process	Version 22 of the Statistical Package for Social Sciences (SPSS) was used for statistical analysis. The averages and standard deviations of quantitative data, like as age and the rate of caesarean sections, were displayed.

3. RESULTS:

Our study showed that out of 183 students

Table 4.1 Case Processing Summary

		N	%
Cases	Valid	183	100.0
	Excluded	0	.0
	Total	183	100.0

Responses were taken from 183 participants, none of them were excluded yielding 100% result

Table 4.2 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
What is your field?	183	1	4	1.87	1.124
I find myself more focused during PBL activities than lectures.	183	0	1	.89	.320
I learn better in team setting	183	0	1	.83	.376
During lecture I often find myself thinking of 0n-related things.	183	0	1	.78	.418
I am easily distracted during lectures.	183	1	5	3.61	1.143
I am more likely to fall asleep during lecture then PBL activities.	183	1	5	3.58	1.187

I easily remember what I learn when working in team than in lectures.	183	1	5	4.09	.991
Team based learning activities are fun and I enjoy them.	183	1	5	4.13	1.027
I do better in exams in topics learned through PBL than lectures.	183	1	5	4.05	1.002
PBL help me improve my grade.	183	1	5	3.97	1.008
I think PBL is better approach to learning as compared to lectures.	183	1	5	4.10	.905
The PBL sessions have improved my understanding of the lectures provided.	183	1	5	4.07	.896
The PBL sessions have helped my ability to work in groups.	183	1	5	4.02	.877
The PBL sessions should be kept as part of education system.	183	1	5	4.19	.853
Group tutorials help students to evaluate their own k0wledge.	183	1	5	4.19	.838
In my opinion, PBL is a great tool for student learning.	183	1	5	4.17	.851
I will like a PBL class style better than a lecture class style.	183	1	5	4.08	.943
I will learn more with a PBL class style than in a lecture style	183	1	5	4.05	.900
I will be more interested in the content of this course in a PBL class style than in a lecture style.	183	0	2	1.24	.590
I will be more aware of what Is expected of me in a PBL class style than in a lecture class.	183	1	5	4.03	.919
I will gain more k0wledge from PBL than in a lecture class	183	1	5	4.07	.905
Doing activities in class helps me understand the material better.	183	1	5	4.23	.800
The teacher will be more helpful in PBL setting than in a lecture class style.	183	0	2	1.21	.596
Valid N	183				

Table 4.2 shows the population of 183 subjects with the age range of 18 to 24 years
The Minimum Year of study was 3 rd year and Maximum Year of study was 5th year.

TABLE 4.3 Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-20	18	9.8	9.9	9.9

	21-23	72	39.3	39.6	49.5
	24 or older	92	50.3	50.5	100.0
	Total	182	99.5	100.0	
Missing	System	1	.5		
Total		183	100.0		

Table 4.3 shows that out of 183 students 9.8% were 18-20 aged, 39.3% were between 21-23, 50.3% were 24 or older.

Figure 4.1

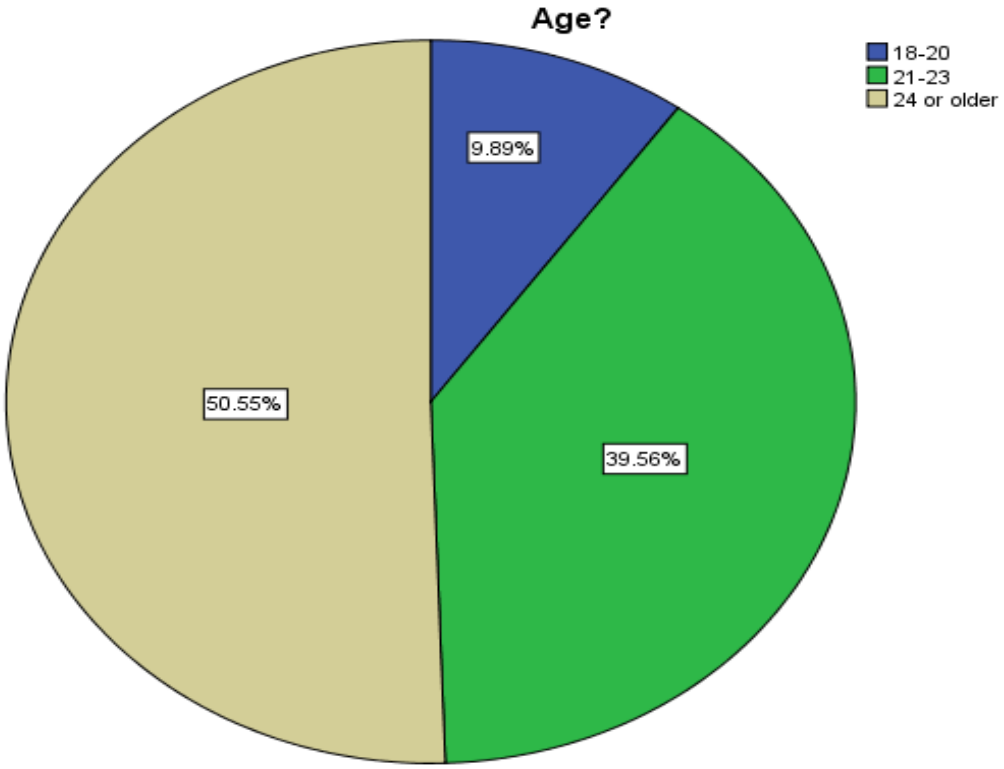

Figure 4.1 shows the frequencies and percentages of ages of students

Table 4.4 Gender

Table 4.4 shows that out of 183 students 139(76%) were female and 44(24%) were table.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	139	76.0	76.0	76.0
	Male	44	24.0	24.0	100.0
	Total	183	100.0	100.0	

Figure 4.2

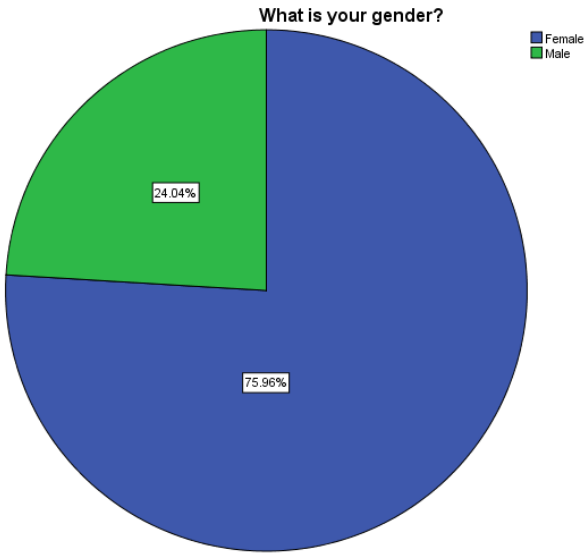

Figure 4.2 shows the frequency and percentages of male and female students

Table 4.5 Year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3rd	24	13.1	13.1	13.1
	4th	28	15.3	15.3	28.4
	5th	131	71.6	71.6	100.0
	Total	183	100.0	100.0	

Table 4.5 shows that out of 183 students 24(13.1%) were in 3rd year, 28 (15.3%) were in 4th year and 131 (71.6%) were in 5th year.

Figure 4.3

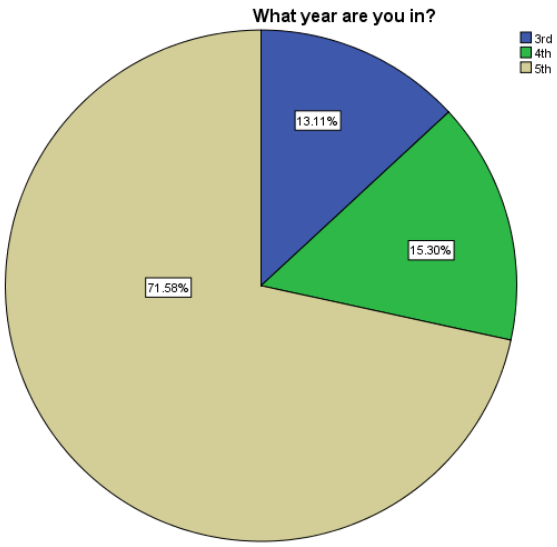

Figure 4.3 shows the frequency and percentages of year students are enrolled in

1. Discussion:

The study aimed to investigate whether problem-based learning (PBL) is an effective method for stimulating effective learning strategies in comparison to lecture-based learning in physiotherapy students. The introduction provides background information on the shift from didactic teaching to interactive student-centered learning in medical education, and the role of the learning environment and approaches in achieving learning outcomes. It highlights the socio-constructivist learning theory and the problem-based learning method, which uses scenarios and group work to promote self-directed learning and boost student motivation. The physiotherapy profession is considered more practical and evidence-based, and PBL has been integrated into physiotherapy education in various ways. Although, the effectiveness of PBL in promoting effective learning strategies in physiotherapy students has not been fully explored. The study addresses this gap in the literature by comparing the study processes of physiotherapy students in PBL and lecture-based environments.

Moreover, there is limited research on the comparison of PBL and lecture-based environments in physiotherapy education specifically. Understanding the effectiveness of these different learning environments is crucial for improving the quality of physiotherapy education and preparing students for clinical practice. Therefore, the present study aims to investigate whether PBL and lecture-based environments differ in terms of their impact on students' study processes and academic performance in a physiotherapy program. By doing so, the study will provide insights into the effectiveness of these different learning environments in physiotherapy education.

In addition, several studies have examined the impact of PBL on students' learning outcomes and have found that it can lead to improved critical thinking skills, problem-solving abilities, and overall knowledge retention (Koh et al. 2008; Savery and Duffy 2001; Dolmans et al. 2005). Furthermore, PBL has been found to be particularly effective in developing students' communication skills, teamwork abilities, and self-directed learning skills, all of which are important competencies for healthcare professionals (Gwee et al. 2008; Albanese and Mitchell 1993; Barrows and Tamblyn 1980).

Despite the growing interest in PBL as a student-centered learning approach, there is still debate over its effectiveness compared to traditional lecture-based teaching methods. Some studies have found that lecture-based teaching is more effective in terms of knowledge acquisition and retention, while others have found PBL to be more effective in developing critical thinking and problem-solving skills (Dolmans et al. 2005; Schmidt et al. 2009). Thus, more research is needed to better understand the comparative effectiveness of PBL and lecture-based teaching in different educational contexts.

Overall, the use of PBL in physiotherapy education has shown promising results in terms of enhancing students' learning outcomes and preparing them for clinical practice. However, it is important to continue to evaluate and refine educational approaches to ensure that they are effective and relevant to the changing needs of healthcare practice.

5. Consent for publication: The study's goals were explained to the participants, and written informed consent was obtained.

6. Competing interests: There are no competing ideas declared by the authors. The study's findings are given simply and honestly, with no exaggeration, manipulation, or improper deletion of information

REFERENCES

1.Masui C, Broeckmans J, Doumen S, Groenen A, Molenberghs G. Do diligent students perform better? Complex relations between student and course characteristics, study time, and academic performance in higher education. Studies in Higher Education. 2014;39(4):621-43.

2.Panhale VP, Bellare B, Jiandani M. Evidence-based practice in Physiotherapy curricula: A survey of Indian Health Science Universities. Journal of Advances in Medical Education & Professionalism. 2017;5(3):101.

3.Vermunt JD, Vermetten YJ. Patterns in student learning: Relationships between learning strategies, conceptions of learning, and learning orientations. Educational psychology review. 2004;16:359-84.

4.Wood DF. Problem based learning. Bmj. 2003;326(7384):328-30.

5Masui C, Broeckmans J, Doumen S, Groenen A, Molenberghs G. Do diligent students perform better? Complex relations between student and course characteristics, study time, and academic performance in higher education. Studies in Higher Education. 2014;39(4):621-43.

6.Mega C, Ronconi L, De Beni R. What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. Journal of educational psychology. 2014;106(1):121.

7. Schmidt, Henk G., et al. "Constructivist, problem-based learning does work: A meta-analysis of curricular comparisons involving a single medical school." *Educational psychologist* 44.4 (2009): 227-249.

.