

**Inquiring into Experiences of Prospective Teachers for Problem Based Learning**

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**Abstract**

*Prospective teachers are not trained to solve problems and issues as well. So there is a dire need for the learning settings to prepare prospective teachers for the professional life by utilizing the factual issues they are dealing with. To keep ourselves prepared for 21<sup>st</sup> century, it is crucial to know the proper way of learning and molding thoughts accordingly. Learners must be able to do various tasks under various circumstances with multifaceted demands. The current research portrays the practices of prospective teachers through Problem Based Learning. Quasi-experimental model was utilized for this research study. In the control group, the lecture-cum-discussion strategy was utilized, while in the experimental group, problem based learning was utilized by arranging sessions of 7 steps approach. The individuals taken as samples were prospective teachers studying the course of Educational Research in Department of Education, International Islamic University Islamabad. The prospective teachers described the experience of their learning of the respective course where the PBL was used for the experimental group. Mean scores were used for analysis purpose. Problem Based Learning was effective experience for the prospective teachers in terms of learning outcome.*

**Keywords:** Problem Based Learning (PBL), Prospective Teachers, Experimental Study, Experiences, Educational Research

**Introduction**

It was indicated in the National Policy on Education (2009) that the major social issues must be replicated by the curriculum and that curriculum should have the capacity to do so. Further, it should offer room for the improvement of significant and complex thinking, problem-solving abilities, inquisition skills, independent learning habits and joint working among students. Along with it, teacher education is in need of establishing reforms in teachers' preparation agendas. Prospective teachers are low motivated and facing academic problems in learning because they are taught by using traditional teaching methodologies. Prospective teachers are not trained to solve the genuine and authentic problems and issues as well. So there is a dire requirement for the learning settings to prepare prospective teachers for the professional life by utilizing the factual issues they are dealing with. According to Norman and Schmidt (1992) and Barrows (1986), for the promotion of diverse most wanted learning outcomes, it was planned that PBL will assist learners in developing problem solving abilities, independent learning skills, joint learning abilities, creating a bendy understanding support and becoming fundamentally provoked for learning. In educational setting, when complex and multifaceted problems and motivational techniques are introduced to learn, it is known as Problem Based Learning approach. In PBL, students are assigned team tasks including one or more problems to solve related to authentic life. Students develop multifaceted complex skills, efficiency and capability to produce and assess the advantages to indicate and understand prime and succeeding problems. Finally, they are equipped with a skill to conclude and be able to work on given problem. By utilizing this method learners are able to develop precise understanding of the concepts. In PBL method, teacher is not the only deliverer of the enormous volume of information, but he is facilitator and guide as well (Schmidt et al, 2009).

Problem Based Learning is a successful teaching method. It is extensively practiced in Pakistan. Especially, Medical Education utilizes it in its departments. It is also critically required to establish this novel methodology of teaching to teach prospective educators so that they could improve multifaceted abilities and could utilize this approach in their upcoming professional life. The

current research embarked on to determine whether Problem Based Learning approach, could be utilized successfully for prospective educators or not. A quasi -experimental design was utilized for Pre-Service Teacher Education to complete this research which offered pragmatic suggestion on worth of PBL.

### **Objectives of the Study**

Following are the objectives upon which the study is based:

- i. To inquire the experiences of prospective teachers tutored by utilizing Problem Based Learning (PBL).

### **Research Questions**

- i. What was the opinion of prospective teachers regarding Overall Experience of PBL?
- ii. *What do prospective teachers say regarding Skills Development during PBL?*
- iii. What were the experiences of prospective teachers with course instructor during PBL?

### **Significance of the Study**

The findings of the current research may add to the existing reachable awareness and knowledge regarding exercising and utilization of PBL at Pre-Service Teacher Education. Findings of the study may guide about the possible problems encountered during the process of PBL. In Pakistan, it is probably a model and representation of learner-centered viewpoint that can help pre-service teacher education.

### **Review of Related Literature**

There is a dire need of comprehending the better and multifaceted ways of learning to meet the requirements of current age. Learners must be trained to do various complex tasks under various complex circumstances. In Pakistan, mostly lecture-based teaching approaches are dominant even from primary to higher education level. Previously these content-driven lecture-based methods were considered useful but now the concept has been changed in modern computerized age. In modern computerized era these traditional methodologies are not considered useful for future working environments as these approaches are unable to prepare learners for working under complex academic setting for fulfilling multifaceted tasks. These type of traditional content-driven strategies are not motivational in learning procedure and do not support for active learning (Duch, Groh & Allen, 2001). PBL is a strategy which explains learners with various tact of "how to learn" during completing tasks in joint group to find out the solution for factual problems. PBL utilizes factual complications and circumstances or situations where learners can learn complex thoughts and abilities to improve problem solving skill and gaining basic subject information. PBL enables learners to acquire lifelong learning abilities, along with the aptitude to discover and employ suitable knowledge possessions. Werth (2009) is of the view that PBL signifies chief advancement of educational practices which silently affects the classes and disciplines as well.

The Problem Based Learning do not establishes the content knowledge. It establishes learning from experiencing to problems. Learners are given material and support while they are enhancing their capabilities and knowledge during they are exposed to problems (Boud & Feletti, 1997). Teachers act like facilitators. They give students problems as an input during the process of learning (Norman & Schmidt, 1992).

Curriculum and teaching strategies have been improved by utilizing Problem Based Learning to improve the educational organization for problem solution. According to Finkle and Torp (1995) in different circumstances, corrective information help in keeping learners energetic and agile individual to solve the poorly organized or ill- defined dilemmas.

Learners are compelled to retrieve previous information and incite arguments as the problems are not properly organized. Reclamation of previous information is important to link the novel knowledge with prior. Problems provoke debates when they based on reference as opposed views and allow learners to produce novel point of views and discussion. If the problem is well structured then there are more chances of generating discussions and arguments and if the problem is not well-structured there are less chances of producing and provoking arguments (Strobel, & Van Barneveld, 2009).

Problem Based Learning helps students in independent learning by creating group tasks. Problem Based Learning is only useful to deliver a small amount of knowledge. PBL only works in small groups and small knowledge. Hmelo (2004) is of the opinion that the practice of exposure to problems plays a vital role in bridging the gap between proper institution study and further realistic

tasks learners encounter with in real life context. It is strong recommendation of PBL method to cooperate learners in making small groups. Schmidt, , Loyens, Van Gog and Paas (2007) are of the view that in PBL method, group consists of 6-10 students who get together two to three hours for each sitting, generally two times per seven days.

Students initiate the learning process in PBL. With respect to learning tasks, to solve the problem, sequence of easy to complex tasks is used for PBL design, so that the learners start from the easy level problem and change gently to more composite problems or identical experts. According to Hung, Dolmans, & Merriënboer, (2019) complex optimization of the load reduction becomes an easy sequential process in the depth with enhanced experience. Subsequently, it allows learner to be aware about easiest piece of work which repeats most complex tasks, along with new information, to stimulate development. According to Silen and Uhlin (2008) the sense of being a leader or in-charge and have a blow upon study site is considered the chief element in self-directed learning. In views of Hung, Dolmans, & Merriënboer, (2019) in PBL design for problem solution easy to difficult, known to unknown pattern is employed for students' ease and understanding so that they may start from easy problems and progress slowly towards difficult ones. Planning and sizing as alternates in PBL in class and delivery medium and mechanism for maintaining the stability should be considered by the institution. It is of no doubt that the effects of Problem Based Learning are many on learning of pupil. PBL method is being implemented by various schools, universities, medical and engineering colleges. Yeo (2005) states that Pakistani, schools, international private medical colleges and public sector medical schools and colleges are utilizing PBL successfully.

Problem involves anything that has clear answer. It is a set of observable facts, experiences or an event that needed some further explanations for further clarifications (Chance, Duffy, & Bowe, 2020). So learners' group works jointly to find out the solution of the problem and interpret the observable facts. Interaction is developed through debates and arguments in minor groups in Problem Based Learning. PBL improves the team work spirits in students by engaging them in combined and joint tasks and activities in smaller groups (Norman & Schmidt, 1992).

#### **Steps in Problem Based Learning**

PBL strongly recommends other approaches to utilize; however, the 7 steps (sometimes called 7-jump) Maastricht PBL approach is commonly utilized. The principles of education are provided for the guidance of learners in a manner that they can create problems and make it complex.

Maastricht while discussing on PBL recommends the following steps:

1. Demonstrating conception
2. Define the trouble or the problem
3. Analyzing the problem / brainstorm or thinking
4. Categorization
5. Formulating the learning problems
6. Independent Learning/study
7. Arguing innovative information (Schmidt, 1983).

The strengths of the group process and the issues that need to be improved are discussed immediate after ending tutorial and reflections in the group. Provision of properly organized and well-timed constructive comments helps students in gaining more profound arguments and discussion. Learning is assumed as a dynamic procedure of knowledge construction instead of inactive remembering procedure. In PBL students are encouraged to build personal knowledge because they are active participants and energetically discuss the topics at-hand, inquire and respond problems.

Independence of learning is ensured for student working on problems in PBL context. They identify sources and relevant writings (i.e. internet sources, editorials, textbooks or textbook sections) in the collection and / or electronic catalogs. Search of the writings and further sources is a significant ability for experts, and is a constituent of Self Directed Learning abilities learners must master particularly in high learning. Scaffold provision is ensured for learners. The resources are not unlimited which is easy for selection.

It is expected that more advanced students rely increasingly on personal abilities to find related sources (Jeong&Hmelo-Silver, 2010).

Research on PBL by Albanese (1993) and similar studies stated were mainly a comparison between the results of PBL methods with more conventional pedagogical methods. Problem based learning represents various distinctive confrontations for assessment as first and foremost focal point

of PBL is learning how to learn and a lesser amount on mastering knowledge and conventional techniques of assessment are not useful (Major, 1999). For evaluation in PBL settings, the alternative evaluation techniques can be an improved. The investigators deduced that joint groups endorse the feelings of possession of the awareness that was produced throughout the semester for the learners. The investigators indicated that inside the groupings, the leadership shifted from one learner to situations as they take place and resolve (Akinmolayan, 2020).

**Research Design**

The present research was quasi-experimental in nature. The experiences of the learners of treatment group were sought after the experiment. After selection of two groups of students who were studying Educational Research, they were assigned on random basis to control group and experimental group. Previously none of the group studied this course. Their previous knowledge regarding Educational Research was similar previous to treatment.

Problem Based Learning was carried out throughout their semester by utilizing various group sittings portrayed in seven PBL steps approach. There was shifting of the roles of the learners in groups. The roles floated and adopted differently as members of the group. The learners enrolled in were taught for 3 credit hours for sixteen weeks(48 hours) as per prevailing policy of HEC. In International Islamic University Islamabad, these learners were studying Educational Research as prospective teachers in Department of Education.

**Sample and sampling Techniques**

In Department of Education, International Islamic University Islamabad, 60 female students enrolled in respective course were selected as witting sample for the study. Further, these students were divided into two groups (of 30 students each) and consigned to the experimental group and control group.

**Course Experience Questionnaire**

The experimental group (PBL Group) was asked to fill in regarding their experience of the course. The learners shared their learning experience of using PBL throughout the semester independently by filling in the prevailing questionnaire.

The questions were associated with their general experiences, skills improvement, assistance offered, program and evaluation of the course. It was based on choices along with statements as Never, Sometimes, Often, Most of the times and Always. To check the validity and reliability of the instruments utilized for the purpose, estimation was made through expert opinion.

**Data Analysis**

Keeping in the objectives of the research the data were investigated. To evaluate the data collected through Course Experience Questionnaire (CEQ), scoring was done through mean scores.

**Findings and Conclusions**

Whilst retorting to the expressions of views the participants were asked to ponder and respond on their overall experience of using PBL approach throughout the semester while studying Educational Research. The inquiry was regarding widespread or common issues regarding their experience of learning the course throughout the semester.

**Table 1**

*Opinion of Prospective Teachers Regarding Overall Experience*

<b>Sr. No.</b>	<b>Declaration</b>	<b>Mean</b>	<b>Standard Deviation</b>
1.	Spotlighting of course and focusing attention to the factual problem are helpful in application to delight.	3.91	.921
2.	PBL approach made learning joy able. I don't get tired.	3.82	1.097
3.	The assessment techniques employed through this course were satisfactory.	3.82	1.181
4.	I was capable to handle time accordingly to facets requisite for Problem Based Learning.	3.68	.995
5.	I want to study other subjects through problem -based learning (PBL).	3.68	1.086
6.	Problem Based Learning encouraged me to employ a profound loom to learning further than the conventional way.	3.64	1.217
7.	My learning motivation was not powerful.	3.45	.963
8.	I was unable to find the literature.	3.45	.912
9.	I experience that in Problem Based Learning, the work-load of course was weighty and complex to handle.	3.45	1.101

10.	I do not have previous information regarding to subject, therefore, I found it difficult to pursue PBL.	3.27	.935
11.	I was not used to joint debates in solving the issues.	3.14	1.283
12.	The problem difficulty stages were properly arranged.	3.09	1.109
	Overall Mean	42.40	4.64
	Mean of Means	3.53	1.27

N=30

The table 1 explains about general experiences shared by respondents. These experiences of prospective teachers are regarding using PBL approach in Education Research. It is represented in this study that the focus of attentions pays off at the end. Spotlighting the course on accurate issues enables the learning course joyful. (M=3.92). It is said that Problem Based Learning sessions made learning enjoyable for them. (M=3.82) and the assessment techniques employed through this course were satisfactory. They were able to manage timing according to surface requirements of PBL (M=3.68). They wanted to study other subjects through problem -based learning (PBL). (M=3.68). It is said that PBL encouraged them to employ a profound loom to learning further than the conventional way (M=3.64). The learning motivational aspect was found to be not powerful (M=3.45) throughout studying. They were unable to find the literature but throughout this procedure they gained familiarity of searching the material (M=3.45). According to them, by utilizing PBL approach, the course workload was neither weighty nor hard to handle (M=3.45). There was no countenanced obscurity in chasing PBL (M=3.27). Their habit was formatted to joint debates in solving the problems (M=3.14). The difficulty stages of the problems were properly arranged (M=3.09). The values depict the excellent experience of learners. Overall mean value of 42.40 with SD of 4.64 and mean of means 3.53 with SD 1.27 express that the participants, by utilizing PBL approach had a wonderful experience.

**Table 2**

*Opinion of Prospective Teachers Regarding Skills Development*

Sr. No	Declaration	Mean	Standard Deviation
1.	Group learning enables me learning from other individuals.	4.14	1.082
2.	This course improved my communication skills efficiently.	3.95	1.046
3.	Problem Based Learning assisted me to find out related knowledge.	3.82	.853
4.	By Problem Based Learning method I was able to use computers for knowledge reclamation.	3.77	1.193
5.	Problem Based Learning, enable me to investigate troubles from diverse viewpoints.	3.64	1.136
6.	PBL developed my discussion skill.	3.64	1.049
7.	Problem Based Learning approach was very interesting to me.	3.59	1.182
8.	The knowledge I gained through PBL is much compare to learning through conventional approach.	3.50	1.058
9.	PBL approach enhanced potential and ability of mine to work productively in a team.	3.50	.913
10.	This approach has enhanced my critical abilities.	3.45	1.143
11.	I have improved skills of solving problem through PBL.	3.27	.985
12.	I have developed my analyzing and synthesizing knowledge skills by Problem Based Learning approach.	3.27	1.162
	Overall Mean	43.54	9.11
	Mean of Means	3.60	1.07

N=30

In Table 2, Skill Development through PBL is presented. This table demonstrates the views of the prospective teachers. It shows that learning through PBL makes prospective teachers collaboratively learn from each other (M=4.14). The communication and efficacy is improved through PBL approach during the study of the course (M=3.95). Students were helped explore knowledge (M=3.82). They improved knowledge of computer (M=3.77). It is declared that various problems were investigated over the period of Problem Based Learning (M=3.64) the discussion and conversation skill was developed (M=3.64). PBL approach was of their interest (M=3.59). They enhanced and gained more knowledge through PBL approach rather than conventional way (M=3.50). This enabled them become more productive as team-worker (M=3.50). Further, the critical ability is increased (M=3.45) Talking about the capability of solving problems, this ability is enhanced

(M=3.27). The skills of making analysis along with knowledge synthesis is improved by using PBL (M=3.27). Concluding the overall Mean M=43.54 and SD 9.11 and mean of mean M=3.60 with SD 1.07 depicts the development and improvement of skills and knowledge of prospective teachers by using PBL. They seem contented and satisfied with this approach.

**Table 3**  
*Opinions of Prospective Teachers Regarding Course Instructor*

Sr. No	Statements	Mean	Standard Deviation
1.	All students were directed and supported by the teacher to explore for different sources associated with the course.	4.09	1.109
2.	Students were convinced and appreciated to take on knowledge enhanced through PBL and factual problem.	3.86	1.082
3.	The teacher aroused students to put into practice the information to other situation/problem.	3.86	1.082
4.	The course teacher aggravated the learners to perform the most excellent	3.82	1.097
5.	We had attained adequate supervision in the learning procedure.	3.82	.907
6.	The teacher provided positive feedback on the work done by learners	3.77	1.152
	Overall Mean	23.22	4.55
	Mean of Means	3.87	1.11

N= 30

Table 3 represented responses of prospective teachers. This table demonstrates regarding teachers who taught the course by using PBL approach while teaching Educational Research. The responses indicate that the respondents were helped and assisted in exploration of sources involved in respective courses (M=4.09). Teachers helped them during the debate to attain and apply knowledge (M=3.86). They are inspired by the teacher to transfer information gathered to practical (M=3.86). This inspired them to achieve excellence (M=3.82). It is indicted that the teachers had reached to the appropriate level of their supervisory role (M=3.82) and the reflection on the tasks and activities of learners is timely (M=3.77). It is delivered in overall Mean 23.22 with SD of 4.55 and mean of means 3.87 with SD of 1.11 that they were helped out and facilitated during the course in PBL.

**Conclusions and Discussion**

Problem Based Learning was good experience for the prospective teachers. The prospective teachers were gratified concerning improvement of various complex abilities throughout the course by way of PBL. The role of the teacher was of the facilitator all through the course in PBL. In tertiary education PBL approach is getting more trendy and fashionable gradually as it is more successful in educational settings and society prototypes, (for example, adaptableness, elasticity, vital thoughts and learning) in manners that are usual methods for learning (Savery, 2006). PBL facilitates students creating improved psychosomatic abilities, like fundamental understanding and vital thoughts (Barr & Tagg, 1995).

PBL is a successful technique for rising creativeness, vital thoughts, mutual efforts or combined tasks and communiqué of prospective teachers. It was conveyed by Erdoganin 2014 that engineering and medicine fields, successfully and uniformly, this approach can be utilized in teaching of prospective teachers. It was described by current research that Problem Based Learning could also be employed efficiently in educating teachers in Pakistan.

Lee, Kim, & Byun (2015) conveyed that high rating was consigned to a little gathering of learners to develop their learning but the encouraging approach of the learners towards the educational value of group-work was improved by several learners who don't contribute sufficiently to their team work. Research has depicted various important elements of PBL e.g. teamwork and cooperation and supervising fresh in unknown environment, facilitating them to become self-regulating in problem solving which may add in several patterns to the purposes of linking through mixed groups, developing thoughts, knowledge sharing, and finally encouragement of the synchronized efforts among clients who are dynamic provider (Christiansen, Kuure, Morch, & Lindstrom, 2013). By using PBL creativeness of future candidates was developed in present experimental study.

Cockerill ,Donaldson, and Caplow (2000) explored the likelihood of individual student extracted from a group. The investigators deduced that joint groups endorse a sense of accountability

for knowledge that was generated for the students throughout the semester. It was shown by study that headship and roles were scuffled in group members within the groups.

Study conveyed that in improving communication skills of prospective teachers Problem Based Learning plays a valuable role as compared to Non-PBL. Barr & Tagg (1995) also favored that Problem Based Learning facilitates students in creating advanced psychological capabilities, e.g. fundamental judging and communiqué skills. It is disclosed during data analysis of attaining and evaluating through PBL approach that prospective teachers did not face difficulties during teaching through PBL approach. According to Wreth (2009) it can be used for other subjects that will help perform well through such techniques. It is indicated and demonstrated in previous studies that PBL assists learners gain and improve important skills like problem solving and critical thinking. This helps attain basic concepts of relevant subjects.

The role of a facilitator is played by teachers in PBL approach. The group or team is guided by teacher in accomplishing the objectives of the course efficiently (Pawlak, Irving & Caballero, 2020). Concentration of students can be drawn towards the challenges by inquiring like; the improving arguments, confirming the correctness and encouraging the assimilation of novel data and knowledge (Savery, 2006). More in-depth discussions and debates can be acquired by giving well-organized knowledge and information. When students receive positive feedback from teachers it helps productive cooperation and joint efforts among them. Students rise issues and teacher give concentration and show interest to guide them towards; editing or working: well-prepared for sittings and reporting the outcomes into their own words (Jeong&Hmelo-Silver, 2010). The findings of the present study also convey that teacher role was as facilitator while studying with PBL approach.

### **Recommendations**

1. As findings show that prospective educators had good experience of PBL, it is, therefore, suggested and recommended for pre-service teachers to adopt PBL approach at their level to increase and enhance the overall learning and skills of the students. This approach is quite helpful in developing skills which are direly needed for the future of learners. Innovation is a key factor which is facilitated and achieved through PBL approach. All the modern teaching abilities can be found in this approach, therefore, it is recommended to may be used in all pre-service education programs.
2. In this study, the findings demonstrate that several prospective teachers felt obscurity in establishment though organizing with PBL, in conclusion, further supervision, introductory sittings and guidance might be organized prior to PBL meeting at initiating the semester , subsequently the learners may not experience some difficulties in adjusting problem based learning.
3. Occasionally the prospective teachers may unable to search the related data for activities; therefore extra hardbacks of the subjects might be accessible in the collection. It may support them to find additional data in easiest manner devoid of slaying a great deal of their time.

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