

Developing Creativity through Problem Based Learning in Prospective Teachers: An Experiment

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ABSTRACT

Students have to be challenged with unfamiliar and disputable problems [0]. Problem Based Learning starts with a Problems alternatively rather than the substance information. The present investigation was attempted keeping in mind the objective to decide if Problem Based Learning, as an instructional approach, could help in improving creativity or not. The present investigation was a quasi-experimental research. Two groups of learners enrolled in Educational Research course Department of Education, International Islamic University Islamabad Pakistan were taken. The two groups were given a pre-test and a post-test; however the treatment was given just to the experimental Group. Problem Based Learning was practiced through numerous group meetings as per seven steps of PBL throughout the semester. The control group which is called as Non-PBL in this investigation was instructed through chalk and talk strategy. The pre-test and post-test were the same and comprised of items on creativity. The respondents were required to tick the appropriate option on 4 point scale on Strongly Disagree, Disagree, Agree and Strongly Agree. The pre-test scores were calculated by Mean and Standard Deviation, difference in pre and posttest of experimental group was calculated through paired sample t-Test while difference in mean scores of Posttest of Control and Experimental was ascertained through independent sample t-Test. The creativity score of prospective teachers advanced after the treatment via problem based learning. It delineates that PBL method is a successful technique for creating creativity of prospective educators. It can be concluded that Problem Based Learning is a viable technique for creating creativity of prospective educators. This investigation yielded that Problem Based Learning can be used adequately in teacher training in Pakistan.

KEY WORDS: Problem Based Learning, Pre-service Teacher education, Pakistan, Creativity, Experiment

INTRODUCTION

Problem Based Learning is an instructional approach which challenges students with structures of "how to learn?" through work between community oriented organizations because of discovering the solutions of actual problems [4]. Problem Based Learning makes use of proper problems so that the learners can explore the solutions and develop problem solving and other abilities. Using Problem Based Learning, learners achieve the aptitudes of learning, along with the potential in accordance with discovery and take advantage of appropriate discipline assets. Problem Based Learning speaks in imitation of a remarkable advancement among enlightening object so much still affects the learning[22]. The Problem Based Learning starts out of beginning according to problems alternatively than the substance information. Learners pick out upon instruction yet aptitudes via a development on ventures with regards to the problems, alongside operable with instructive substances or help from coaches any action as much facilitators [2]. The problem is the important performance for the newcomers among the instruction procedure. These problems emerge of educated practice; among special cases, allude to occasions then issues run regarding the mill after a unique area of discipline [13].

Problem Based Learning accommodates the improvement concerning instructional software then methodologies in accordance with build upon the instructive case to receive greatness regarding the problem beyond some viewpoint yet disciplinary facts yet aptitudes afterward once more by using setting newbies in a strong section because the arrangement concerning ill structured problems [6]. Problems are organized of a course to that amount inexperienced persons may cite their formerly learning, think about the Problems then for this reason incite talks. Recuperation over earlier study is fundamental because of associating instant statistics after it. Problems can stay mentioned so such includes references namely limiting factors concerning view, permitting inexperienced persons according to assign conflicts because of or towards each standpoint yet investigate which are the auspicious

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alternative. Writing advised where quantity the problem do make begin deliberation is the refinement within the specifically sorted out then unstructured Problems [20].

Learning troubles made among the businesses then workout routines rule learners' self-think respecting into Problem Based Learning. Problem Based Learning is not fabulous so colossal quantities regarding information have to stand born after learners. The activity regarding presentation to problems is simple to overcome any limitation among configuration institutional lesson or more technological exercises the college students might also journey among authentic handy life [9]. An answer element among the PBL approach is the stage over sharing between small groups. The organizations commonly contain regarding 6-10 college students whosoever meet 2 in accordance with three hours for every session, typically double every week [7].

In PBL, lesson is precipitated by the learners. The just widely recognized potential at the level on the son into PBL is the self-coordinated discipline durability [17] seen so the supposition on forlorn government or influencing education state of affairs is without a doubt the indispensable putting within the coordinated learning. With respect in conformity with the study errands are concerned, easy according to complicated assignments class is old of Problem Based Learning to smoke seriousness over Problems, then rookies begin out of the simpler Problem or motion continuously in accordance with more unpredictable problems [11].

Keeping within thinking the stop intention in conformity with maintains upon foundations must reflect on consideration on the changes in the timetable regarding instructing, type estimate, and the kind about carry and establishment. Problem Based Learning utilization has penalties because the learning. These contain utilizing the strategy for Problem Based Learning among dense colleges and colleges. Utilizing Problem Based Learning or globalization among typical universities on Pakistan which is of pursuance including global hints, internationalization about private scientific schools are moreover utilizing Problem Based Learning into Pakistan who is together with a test according to the medicinal faculties between human beings into usual portion according to opponent the rate or area concerning comparable training, yet that is everyday so the lesson mold in Pakistan used to be taking that instant way of life yet redact the sparrow into lesson results then yields on coaching [23]. Problem is the account concerning an association on events up to expectation requires an elucidation in accordance with the quantity the necessary method fundamental process, yet the regulation yet standard. A crew regarding freshmen collaborate in imitation of liven the troubles indicated of the particular problem. Little crew discourses into Problem Based Learning improve ligature among peers. Learners answer a development about inquiries or give clarifications yet speak in regard to the distinctions between sentiments yet understanding the ideas. These techniques possess a strong instruction concerning the subject. The bland yet cooperative employment among short agencies additionally expands the ability to job between groups, a fundamental capability into proficient practice [13]. The course on Educational Research has been intended for MA and BS (Education) learners. This course features the importance of essential, connected, logical and activity look into. Course additionally shed light on different sorts of instructive research e.g. test versus non-test look into, engaging examination, causal similar research and co-social research. It is an early on course which fills in as an establishment for learners who have practically zero learning about instructive research and will assist learners in arranging and execution of Research Project likewise [8].

Statement of the Problem

Problem Based Learning is a viable procedure for educating. In Pakistan, it is being utilized widely in Medical Education. There is a need to receive such learner focused and creative technique for learning of prospective educators so they might have the capacity to create abilities identified with it and might have the capacity to utilize this procedure in their future career as instructors. The present investigation was attempted keeping in mind the end goal to decide if PBL, as an instructional approach, could help in improving creativity or not.

Objective of the study

The study was carried out to investigate the impact of Problem-Based Learning on creativity of prospective educators.

Hypotheses of the Study

H₀₁: There is no noteworthy mean distinction in creativity score of the Pre-test and Post-test of control group educated through Non-Problem Based Method.

H₀₂: There is no critical mean contrast in creativity score of the Pre-test and Post-test of test assemble educated through Problem Based Learning (PBL).

H₀₃: There is no huge mean contrast in creativity score of the test group educated through Problem Based Learning (PBL) and the control assemble instructed through Non-PBL strategy.

Significance of the Study

It is hoped that the aftereffects of the present examination have added to the present body of knowledge about utilization of Problem Based Learning in Pre-Service Teacher Education. It has given the proof of viability of Problem Based Learning for developing creativity.

LITERATURE REVIEW

Problem Based Learning is an instructional procedure of defying students with aptitudes of "how to get learning by working in common groups for finding the solutions to real world problems [4]. Problem Based Learning empowers students to secure basic considering and critical thinking capacities, and picking up information of the fundamental ideas of the subject. It includes Problems of present reality. Problem Based Learning encourages students in obtaining the capacities of deep rooted getting the hang of, including the aptitude to find and use reasonable learning sources. Problem Based Learning connotes a fundamental advance in enlightening practice that still influences the courses and teaches all through the universe [22]

Steps in Problem Based Learning

There is the generally spread process utilized as a part of Problem Based Learning is 7 Steps called as Maastricht Problem Based Learning approach. This approach offers the apparatus of the laws of learning in a deliberate strategy to guide students to create learning and information inconveniences of this Problem.

Maastricht approach of Problem Based Learning has the accompanying advances:

1. Illustrating ideas (characterizing terms)
2. Defining the Problem
3. Problem investigation/conceptualizing
4. Classification
5. The detailing of learning troubles
6. Self-ponder
7. Discussing new learning

The main phase of Problem Based Learning incorporates stage 1-5 and it proceeds with 1-2 hours as it begins with meanings of different terms and ideas which may encourage the group to start with a conspicuous cognizance of the wordings and ideas well-known to the Problem. After that students may arrange the problem or put a correct portrayal of the problem. At this point the group of learners set up the breaking points of the problem under debate. From that point forward, students break down the Problem to restore the current comprehension and mindfulness and initiating past data. After that the second stage is started which may incorporate self-thinking. The second stage encourages the group of workers to discover the important writing. It offers the group with a rundown of things that are applicable to the problem. A report is set up by associating the earlier information with new learning. At the third stage the recently gained information is talked about and for the most part, this stage is booked after some days to designate time for singular learning. This session remains 1-2 hours as at this stage the cooperation of each learner of the group is required to counter to the learning issues. To pick up illuminations and subtle elements of learning and data noting session is started. The profundity of comprehension and knowledge into these problems is discussed [18].

In Problem Based Learning inexperienced persons are no longer certain in accordance with a particular file asset; he are allowed in conformity with assume respecting yet find property then fitting literature (i.e. internet assets, articles, books or e book sections) among the library yet electronic databases. Looking of appropriate writing and other associated assets, is a capability because of specialists [10]. In Problem Based Learning the trainer assumes the quantity about a facilitator, whichever may direct the group/group in accordance with fulfill the goals concerning the application adequately. He/she can seek in conformity with make up their assignment towards the difficulties and in imitation of help the concentration on current facts and information. The unmistakable parts of PBL comprise of driving inquiry or problem, interdisciplinary concentration, dependable examination, innovation of articles and showing and collaboration/collective endeavors [16].

Effectiveness of Problem Based Learning

An examination between the results of Problem Based Learning and other customary techniques for instructing was given by various inquires about in medication e.g. [1] and

[23]. Research demonstrates that experts are set up with the assistance of PBL procedure. The correlation of Problem Based Learning with conventional strategies can be appeared through these investigations. Then again, some particular difficulties for assessment are being exhibited by the Problem Based Learning. As indicated by [12] the essential worry of Problem Based Learning is to obtain the abilities of learning while at the same time having

less concentrate on conventional strategies for assessment and furthermore having less worry about facing a group of comprehension.

Creativity

We see improvement in view of helpful thoughts like delivering reasonable water, new wellbeing gadgets, restorative cures, control age, we likewise observe the capacity to deliver new things and execute them, this is all a result of basic considering and creativity and we utilize them to make the personal satisfaction somewhat better. Creativity is turning into a vital aptitude as we see a change in perspective from assembling to learning base to creativity economies. [19] characterized creativity as imagination is a novel work which is considered as helpful by a group of individuals sooner or later in time. Curiosity and convenience were utilized by numerous researchers while characterizing the term so these qualities are viewed as imperative for creativity. [15] directed an examination on all the exploration done on creativity and definitions used to expand it. They found that larger part were not characterizing the idea expressly but rather certainly and everybody utilized one of a kind and helpful in pretty much fall the ideas. It is the point at which we communicate between abilities, process and condition, with the assistance of which any individual or group of individuals can create any detectable item that isn't just novel yet helpful inside a social setting.

Self-evaluation is a procedure utilized for the exploration or direction reason. Some self-evaluation methods are exceptionally intended to identify the creativity. There are some different tests which decide the creativity styles that how individuals utilize their imagination and how much individuals trust in their creativity.

MATERIALS AND METHODS

The present investigation was a quasi experimental research. Two groups of learners selected in Educational research course were taken for the examination. The two groups were given a pre-test and a post-test, however the treatment was given just to the experimental Group. The teacher, learning conditions, course material and assessment of both PBL and Non-PBL groups were same. The instructor had consultancy hours for both the groups and assistance to the two groups was given.

Teaching to PBL Group

Problem Based Learning was practiced through numerous group meetings as per seven steps of PBL throughout the semester. The entire course of Educational Research was instructed in complete semester (four months) to prospective instructors enrolled in Department of Education International Islamic University Islamabad for the course of Educational Research. As a beginning stage for the PBL the educator of the course clarified the way the course will be managed. They were demonstrated some of recordings accessible on web about pragmatic usages and ventures of PBL which cleared their conceptions about how they will take over the course of Educational Research. Working in groups, they were tested to deliberately inquire about the problems exhibited and to make determinations from the realities and conclusions found in writing. The learners accumulated related data from the recommended books, web and library in the week time. Wherever they will require direction the instructor was accessible for consultancy and help. The learners used to sit in the classroom and talk about all material grouped exclusively and achieve a conclusion. They exhibited the solidified material to the entire class. The instructor was there as facilitator and further clarified the ideas if not clear.

Teaching to Non-PBL Group

The control group which is called as Non-PBL in this investigation was instructed through chalk and talk strategy. There were singular introductions of the learners identifying with sub-subjects of the course blueprint of Educational Research. There was no group work in the Non-PBL group. The classroom condition of both the groups was same.

Sample and testing Techniques

A purposive sample of 60 learners studying in Department of Education International Islamic University Islamabad was taken for the examination. Two groups of learners were taken and they were assigned to the control group and exploratory group randomly. Each group had 30 learners each. The investigation was led in Spring semester February to June 2016.

Pre-Test and Post-Test

The pre-test and post-test were the same and comprised of items on creativity based on literature review. The respondents were required to tick the appropriate option on 4 point scale on Strongly Disagree, Disagree, Agree and Strongly Agree. It had 15 items.

Validity and Reliability of Instruments

The face validity of the instrument was assessed through expert opinion. The experts were faculty members from Department of Education. The reliability of the instrument was estimated by utilizing Cronbach Alpha after pilot testing the instrument on the learners other than the sample and the value was 0.846.

Data Collection

The pre-test was executed in the beginning of semester to all learners of both groups. Post-test of both Experimental and Control Groups was managed toward the end of semester.

RESULTS

The pre-test scores were calculated by Mean and Standard Deviation, difference in pre and posttest of experimental group was figured through paired sample t-Test while difference in mean scores of Posttest of Control and Experimental was ascertained through independent sample t-Test by using Statistical Package for Social Sciences Version 20 (SPSS 20).

Table 1. Difference between scores of PBL and Non-PBL Groups on Pre Test (Creativity)

	Mean score	Standard deviation	P value	df	Sig.(2tailed)
PBL Group	44.27	8.994	1.0000	58	0.05
Non-PBL Group	48.37	6.239			

Table 1 displays that the mean score of PBL Group is 48.37 with SD of 6.23 and the mean score of Non-PBL Group is 44.27 with SD of 6.23. An independent sample t-Test was performed to separate whether the mean scores of PBL and Non-PBL clusters are different or not about creativity of prospective educators? The t-test delineates no huge contrast in the scores of PBL Group and Non-PBL Group as p value 1.00 is more than $\alpha=0.05$. So both the groups are proportionate concerning creativity scores on pre-test.

Table 2: Difference between scores of Pre-Test and Post Test of Non-PBL Group (Creativity)

	Mean score	Standard Deviation	p value	Df	Sig.(2tailed)
Pre-test	48.37	6.239	9	58	0.05
Post-test	46.03	5.580			

Table 2 depicts that the mean score of creativity of Pre-test of Non-PBL Group is 48.37 with SD of 6.23 and the mean score of Post-test is 46.03 with SD of 5.58. A paired sample t-Test was performed to see whether the mean scores of Pre-test and Post-trial of Non-PBL group are different or not? The t-test demonstrates no noteworthy contrast in the scores of Pre-test and post-trial of Non-PBL Group as $p=0.13$ is more than $\alpha=0.05$. So both the scores are proportional concerning creativity scores. It shows that Non-PBL Method isn't a practical procedure for creativity of imminent instructors.

Table 3: Difference between scores of Pre-Test and Post Test of PBL Group (Creativity)

	Mean score	Standard deviation	p value	df	Sig.(2tailed)
Pre-test	44.27	8.994	0.0486	58	0.05
Post-test	48.03	4.870			

Table 3 shows that the mean score of creativity of Pre-test of PBL group is 44.27 with SD of 8.99 and a better suggest score of post test is 48.03 with SD of 4.80. A paired sample t-test was done to look at whether the suggest rankings of Pre-test and post-test are considerably different or not? The t-test display a sizable distinction as $p=0.04$ is lesser than $\alpha=0.05$. That means that creativity score of potential educators has advanced after the treatment via problem based learning. It delineates that PBL method is a successful technique for creating creativity of prospective educators.

Table 4: Difference between scores of PBL and Non-PBL Groups on Post Test (Creativity)

	Mean score	Standard deviation	p value	df	Sig.(2tailed)
PBL Group	48.03	4.870	0.0002	58	0.05
Non-PBL Group	46.03	5.580			

Table 4 indicates that the mean rating of creativity of PBL group is 48.03 with SD of 4.87 that's better than the mean score of Non-PBL group which is 46.03 with SD of 5.58. An independent sample t-test was conducted to look whether or not the suggest rankings of PBL and Non-PBL are notably distinctive or not? The p value 0.0002 is lesser than $\alpha=0.05$. So both the ratings aren't equivalent with admire to creativity scores of prospective educators. That implies that creativity score of prospective teachers has increased after the treatment through PBL. It represents that PBL is an effective strategy for enhancing creativity of prospective teachers.

DISCUSSION

Various expert associations like the National Education Association and the National Research Council have emphasized the need to instruct learners in the 21st century skills which includes creativity also[14]. This examination comes about delineate that the innovative thoughts, instructor's participation, collaboration, inspiration and talk with others help in obliging the course through Problem Based Learning [18]. Research has distinguished parts of PBL and procedures of participation and cooperation and managing in new settings, helping them to wind up plainly free problem solvers which include different approaches to the points of associating with arranged groups of individuals, enhancing creative and cultivating the organized meetings among learners [3]

In the current research creativity of prospective instructors was enhanced because of Problem Based Learning. It can be set up that Problem Based Learning is a viable technique for creating creativity of prospective educators. [5] recommended that in training of prospective educators, problem based learning could viably be utilized as it is used in designing and medication. This investigation yielded that Problem Based Learning can be used adequately in instructor training in Pakistan too. Exponents of the viewpoint of problem-solving as a skill, consider problem-solving skills as a separate issue in the curriculum; and do not consider it as a tool to improve conceptual perception and basic skills; such as drawing a picture, looking back, preparing a list, and others [15 A]. So it may be utilized as a teaching strategy in teacher education as the current research yielded its effectiveness.

CONCLUSION

Non-PBL Method isn't a practical procedure for developing creativity of prospective teachers. The creativity score of potential educators has advanced after the treatment via problem based learning. It delineates that PBL method is a successful technique for creating creativity of prospective educators. In training of prospective educators, problem based learning could viably be utilized as it is used in designing and medication.

RECOMMENDATIONS

Following suggestions were drawn on the premise of consequences of the study

- i. As prospective instructors had great experience of the course through problem Based Learning so it is suggested that it might be used in all teacher training programs for the subject of educational research.
- ii. The creativity of prospective teachers improved as a result of PBL, so it may be utilized for enhancing creativity among learners.

Further Research

Further research may be carried out to check the effectiveness of PBL for other subjects of pre-service teacher education.

Another research may be carried out to see effectiveness of PBL for developing other skills like critical thinking etc. of prospective teachers.

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