STUDENTS' PERCEPTION OF PROBLEM-BASED LEARNING IN ELEMENTARY SCHOOL TEACHER EDUCATION

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Abstract

This study seeks to explore students' perception of problem-based learning. To find out of it, the study distributed a questionnaire given to 464 Elementary School Teacher Education Students who approached with a problem-solving methodology. A quantitative research technique was used to figure out the findings of the investigation. SPSS and Structural Equation Method (SEM-AMOS) were used to arrive at the results. Learners' engagement was raised because of implementing learning methods like active learning, iterative learning, and authentic learning. The results indicate that students are encouraged to participate in Problem Base Learning, which increases engagement by allowing students to share and discuss their findings. Therefore, PBL is essential such that students are encouraged to employ this approach in their academic endeavors. Further, universities also similarly urge them to do so.

Keywords –Problem-based learning, Elementary school, E-learning.

1. Introduction

Problem based learning (PBL) is becoming a popular model of learning to improve higher order thinking skills (HOTs). This model also anggage the student to adjustment in the teaching style. However, the bulk encourages teachers to listen to, examine, and study students' evolving views. Being responsive in such a learning environment is essential that a collaborative learning process exists when the teacher does not deliver or offer instruction, but rather helps students negotiate between themselves and with the teacher as their ideas develop and mature (Shulman, 1987).

Learning for students in PBL has been defined as a pedagogical strategy characterized by the use of patient problems as a learning environment building problem solving and knowledge acquisition skills with relation to basic and clinical sciences. The teacher's guide to good prescription says that for each session, facilitators should set a clear aim, teaching and development of learning goals clearly transmitted to the students (Barrows, 1996). Differences are tolerated; students consider learning targets as their own, are responsible for planning and delivering learning sessions and are encouraged to participate actively in the learning process. A clinical problem is presented to groups and a number of steps are taken in order to discuss possible mechanisms and causes, to produce assumptions and methods for testing them, to present additional information, to use this new information to refine their assumptions and to finally reach a conclusion (Wee, 2004).

Problem-based learning is constructed on a collaborative and integrative basis in a small group. An instructor or a facilitator accompanies the small groups. The effectiveness of the tutor is vital at the early stages of the PBL sessions, while the success of the small group process in the learning process is crucial at the end of the sessions. Both facilitators and students must be familiar with the skills needed for good working in small groups in order to realize the benefits of PBL. Examples of these are consensual decision-making skills, speech

and discussion skills, team maintenance, conflict management skills, and team leadership (Hmelo-Silver, 2004).

Literature Review

PBL

Al-Rahmi et al. (2017) claim that teachers don't teachers do not give correct answers; they confer it with pupils in the discussion activities held, discussing and revising ideas. (Al_rahmi et al,, 2017). Underprepared minority pupils in an urban setting were assisted with a problem-based learning method model developed by (Dong & Warter-Perez, 2009). PBL, which uses claim-based learning (CL) as its core, warrants understanding, but also explanations, sustain, and structure - or non-familiarization - that attracts the thinking ways of obtanining the information, internalising, and lowering thinking difficulties by doing the collaboration activities (Al-Rahmi, Othman, & Yusuf, 2015); Hron & Friedrich, 2003). The quality of knowledge and learning abilities increases when students are involved in participatory learning, which makes it easier for them to interact with one another (Al-Rahmi et al., 2019). A mixtureof problem-solving, critical thinking is good for students (Chu & Macgregor, 2011).

According to the scientists, a PBL strategy that incorporates both discipline and participation has been shown to boost students' motivation to grow their IT and collaborative skills, along with their science knowledge, as past research has (Hron & Friedrich, 2003). In a recent study by Bagheri and colleagues (2013), PBL was found to be a successful tool for enhancing students' IT skills, science-technology integration, and cooperative abilities (Imafuku, Kataoka, Mayahara, Suzuki, & Saiki, 2014). The challenge-based learning approach's aim is to help students grasp the fundamental concepts of a given subject matter in the context of the problems they deal with in their everyday lives (Rogers, 2011). Other studies have found that, like the findings of (Matovinovic & Nocente, 2008) and Morales et al., the sites and projects students complete often increase their

IT abilities (2000). (2013). There are a variety of linkages between research and learning, although they differ amongst disciplines (Al-Rahmi, Alias, Othman, Marin, & Tur, 2018); Al-Rahmi et al., 2019). PBL encourages students to explore questions, not just accept the first answer that presents itself (Rogers et al., 2011).

Despite many teachers' attempts to get students to speak up and participate in classroom discussions, research has shown that classrooms often end up being areas in which the educators speak and tutors catch information explained (Bain, 2006). Teachers are meant to convey information to inactive tutors that obtain it, according to the teacher-based model (Jackson, 1986). Socio-cultural research indicates that learning happens through cultural and historical participation in cultural and practice-specific discourses (Gutiérrez & Rogoff, 2016). PBL, a strategy employed in schools all throughout the country, is based on the idea that students in the classroom are skilled and resourceful meaning creators, and which activities having good performances give new views that educators can requite to in a meaningful way (Lampert et al., 2013). According to (Bilbao, Varela, Rebollar, Bravo, & García, n.d.) PBL's most important premise is its role in improving learning by developing vital skills, interaction, and the learning of course materials as compared to the direct learning technique.

The traditional PBL processes are:

1) Understand the terms of the situation/clarify
2) Design an action plan
3) Implement an action plan
4) Identify the problem
5) Propose feasible solutions
6) Identify the kind of information needed
7) Enter the information

Web-based PBL

Thanks to its close linkages with collaboration at work and interdisciplinary learning, it has evolved beyond the typical field of clinical training to encompass practical subjects such as Science, business studies and engineering Banta, T., Black, K. and Kline, K., 2021). An ever-increasing amount of study has been done in various educational and organizational settings to examine the effectiveness of problem-based learning, including the extent to which it realizes its promise to develop self-directed learning habits, problem-solving abilities and deep disciplinary knowledge. Most previous PBL research focused on the effects of this method in the curriculum with subsequent research deeper into the PBL-based processes and how they are contributing to better learning results. This paper explores a wide range of research on the usefulness and effects of PBL and how students learn through this process.

The study authors Strobel and van Barneveld evaluated a number of meta-analyzes of the effectiveness of PBL and found that PBL is more effective than traditional techniques in terms of long-term information retention, efficiency or skill assessment as well as a combination of knowledge and expertise. However, PBL was found to be less successful only when the focus was on the acquisition and retention of short-term information. According to the World Health Organization, PBL seems to be a superior and effective strategy for 'training competent and experienced practitioners and increasing long-term retention of knowledge and skills obtained via learning experience'.

Research objectives

The scholars have described a wide range of PBL techniques, some of which highlight methods or features of specific successful lesson routines, such as modeling or discussion facilitation, whereas others highlight methods or features of teachers' lesson planning, which helps beginners approximate learning by engaging them in the process. Scholars have presented a variety of

PBL techniques, some of which highlight methods or features of specific successful lesson routines, such as exemplifying and deliberation facilitation, while others highlight methods or features of teachers' lesson planning, which helps beginners approximate learning by engaging them in the process. PBL strategies like this appear to be making an impact on how teachers who are inexperienced teach in the classroom. In accordance with results by various experts, this research explored students' perception on the usage of problem based website learning (Web-based PBL), hence the following hypotheses were formed in this research:

Hypothesis: There exists correlation between problem-based learning and students' motivation, Create a Positive Classroom Climate, Enhance Problem-solving Skills, and web-based learning activity

According to Carpenter et al. (2012), PBL "involves teachers working together at a particular level during the preparation, execution, and/or evaluation of a course, with an emphasis on training expertise and reflective discourse". Numerous studies have found that PBL offers a wide range of learning opportunities that are good to both inexperienced teachers and their professional and personal development. To become an expert, teachers must exchange information and abilities across a number of fields, and working in a team facilitates this process. By working together in the classroom, teachers and students can discover things together. A particularly relevant and exciting teaching method may be to use teamwork in order to address issues in a new way. Simons and Baeten (2016) discovered that the PBL technique benefits student teachers in multiple ways, including greater emotional and professional support, educational skills improvement, and increased confidence.

2. Method

The goal of this research is to create a model of web-based PBL effectiveness by conducting a critical review of it. A teacher survey was

conducted to determine the success of the web-based PBL strategy. In order to do this, the various factors which were considered are: Student Motivation, create a positive learning Climate, Develop Language Skills, Enhance Problem solving skills and all of which had the effect of increasing student involvement. As a means of data collection, a questionnaire was formulated and given to 464 Elementary School Teacher Education Students who approached with a problem-solving methodology. The questionnaire comprised of 14 different questions on testing the students' knowledge on the above factors. Those who took part in the session were among the teachers who were involved in PBL.

To recruit a wider range of participants, a 5points-Likertscale was created and distributed to all subjects (14 items) where 5 – Strongly Agree, 4 – Agree, 3 – Neutral, 2 – Disagree, 1 – Strongly disagree. A random sampling procedure that was easy to perform was employed to select the sample population for this study. Two subject matter experts carefully reviewed the survey to confirm its validity and then asked the students to utilize a 5-point Likert scale to rate various items, ranging from strongly disagree to strongly agree. SPSS was used to analyze students' responses to the numerous questionnaire items, and the answers were input and counted.

In the Statistical Pack for Social Sciences (SPSS), which was used as the primary means to analyze student responses to various questionnaire questions, students' replies to the different questionnaire items were input and tallied? SEM was use in this investigation in particular.

Instruments of Measurements

The construction pieces were adjusted in order to achieve have satisfactory content validity. The study was separated into two main portions. The aim of the first half was to collect demographic data on teachers as well as the age and gender of the teachers who have used the PBL technique to

engage pupils in the second section. The modifications to the second half are follow,: Problem-based learning approach six parts were modified (Grossman, 2019); three parts were considered for each element that were also taken from (Grossman et al., 2019).

Sample Characteristics

There were 464 questionnaires for male respondents [87,06%] and for female respondents [12,93%]. It is observed from the Fig.4 that there is a strong acceptance of the fact that Problem-based website learning has helped the students gain more knowledge compared to the conventional mode of teaching.

Data Analysis and Results

If the Cronbach reliability coefficient of .947 is considered, the related aspects have an impact on cooperation and communication in learning. In this study, three criteria were applied in particular to determine discrimination: a variable index value less than 0.80 in this study (Hair et al., 2012). The elements and factors for the construction under consideration therefore had a factor load of 0.7 or higher, acceptable for Cronbach's alpha, and a value higher than 0.70, this is in accordance with construction investigations (Hair et al., 2012).

Table 1. Good Model Fit and Reliability.

RMR	Near to 0 (perfect fit)	.032	.031
IFI	Value should be = or >0.90.	.0931	.0941
NFI	Value should be = or >0.90.	.0942	.0953
RFI	Value should be = or >0.90.	.0960	.0956
CFI	Value should be = or >0.90.	.0920	.0945
TLI	Value should be = or >0.90.	.0971	.0965
RMSEA	Value <0.10 means a good fit, and <0.05 indicates a very good fit.	.036	.040
Factors	(AVE)	Composite reliability	Cronbach's □

Student Motivation (SM)	.599	.927	.906
Create a Positive Classroom Climate (CPCC)	.612	.940	.899
Enhance Problem-solving Skills (EPSS)	.607	.891	.911
Web-based Skills (WBS)	.617	.918	.905
Type of measure		Acceptable level of fit	
		Measurement model	Structural model

Note. RMR =root mean square residual; IFI =incremental fit index; NFI =normed fit index; RFI = relative fit index; CFI =comparative fit index; TLI =Tucker–Lewis index; RMSEA = root mean square error of approximation; AVE = average variance extracted.

Measurement Model

This study used SEM-AMOS statistics version 23 to evaluate the data, based on CFA. The model is based, among others, on the concepts of convergent validity, uniformity, consisten, discriminatory validity. further (Hair et al., 2012) stated that the model assessment was carried out in the form of the highest probability assessment method, employing appropriate fit- ting strategies such as Chi-square, Normed Chi-square Fit Index (NFI), RFI, Tucker–Lewis Index (TLI), CFI, Incremental Fit Index (IFI), Parsimonious Goodness-of-Fit Index (PGFI), and A (RMSEA). A model assessment was performed using fitting profiles shown in Table 1. The measuring model is shown in Figure 2.

The amount of understandiing is exam using a range of metrics linked to different ideas that are covered in discriminatory validity. On the basis of the obtained AVE values, all values above 0.50 - cutoff with a value of 0.001 show the validity of all examined structures. For the following structures, AVE values were obtained: (Fornell & Larcker, 2018). Moreover, the link between elements between structures cannot, according to Hair et al. (Hair et al., 2012). The Alpha values of Cronbach are within 0.70 orhigher, the suggested value being 0.50 or higher, which is the optimum number as well. The total loading factor exceeds 0.50, which is of critical importance, thus complying with Fornell and Larcker (1981). see Table 2, Figure 2.

3. Result and Discussion

Results

The results show a statistically significant association between the PBL and SM techniques as well as positive and statistically significant correlations. In other words, all respondents in our sample agreed that SM. benefitted from the PBL method. The following effect is the association between the PBL approach and the CPCC, which shows positive and have a significant correlation on hypothesis two, which all the interviews felt had an influence on CPCC. Due to a link between the PBL method and CPCC, a positive-statistically important correlation of the third hypothesis, i.e. all respondents agreed that the PBL approach had an influence on EPSS in this sample. In addition, the link between PBL and EPSS also shows a positive and considerable correlation in support of the fourth hypothesis.; in that sample all respondents felt that the PBL approach increased WBS. The results indicate that the hypotheses proposed are positive and significant; the findings confirmed all the hypotheses in this sample.

Table 2. Discriminant Validity.

Variables	PBL	SM	CPCC	EPS	WBS
Project-based learning (PBL)	**.831**				
Student Motivation (SM)	.437	**.910**			
Create a Positive Classroom Climate (CPCC)	.541	.502	**.892**		
Enhance Problem-solving Skills (EPSS)	.398	.393	.431	**.887**	
Web-based Skills (WBS)	.375	.415	.411	.438	**.912**

Bold values refer to more than .700.

Hypothesis	Independent	Relationship	Dependent	Estimate	SE	CR	P	Results
H1	PBL	→	SM	.278	.030	8.178	***	Supported

H2	PBL	→	CPCC	.083	.032	3.008	***	Supported
H3	PBL	→	EPSS	.331	.331	8.922	***	Supported
H4	PBL	→	WBS	.365	.325	8.122	***	Supported

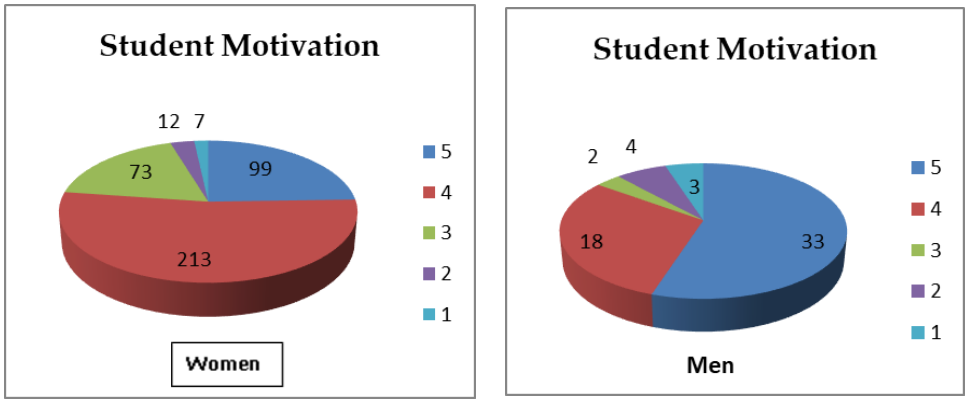

Figure. 1 Comparative Analysis of the questionnaire survey of Men and Women

It is observed from the Fig.1 that there is a strong acceptance of the fact that Student Motivation has resulted in the increase of the presentation and learning skills of the students between both Male and female students.

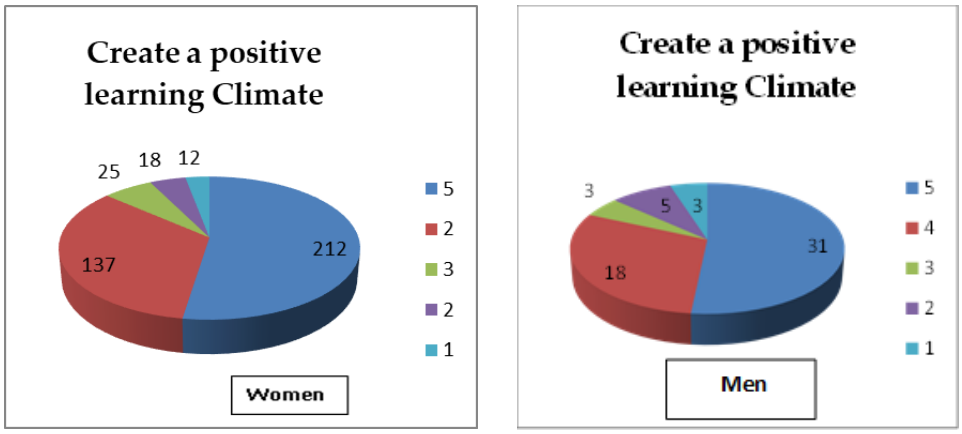

Figure. 2 Comparative Analysis of the questionnaire survey of Men and Women

It is observed from the Fig.2 that there is a strong acceptance of the fact that creating a Positive learning Climate has helped the students change from passive mode to active learning mode. It is observed from the Fig.3 and Fig.4 that there is a strong acceptance of the fact that developing language skills has helped the students' linguistic skills and confidence in solving skills.

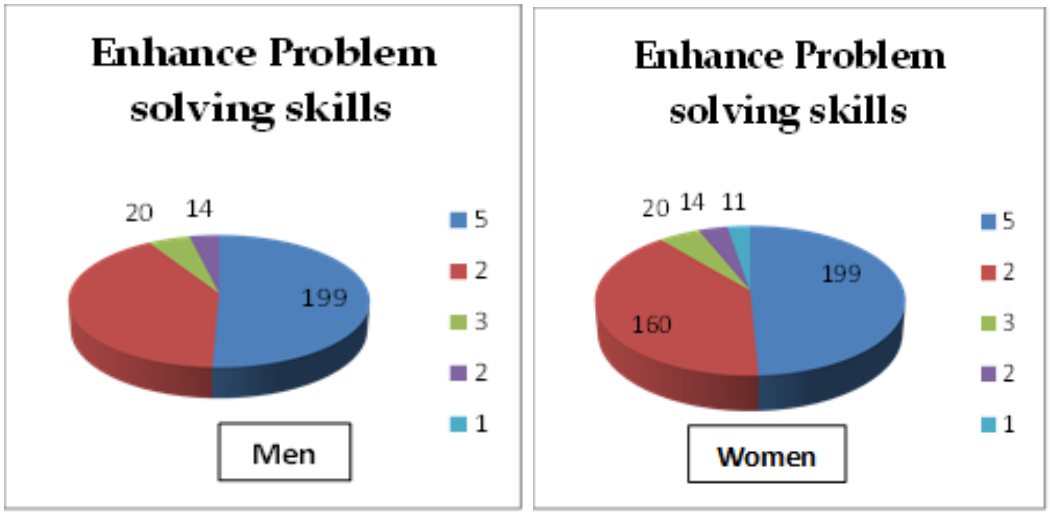

Figure 4 Comparative Analysis of the questionnaire survey of Men and Women

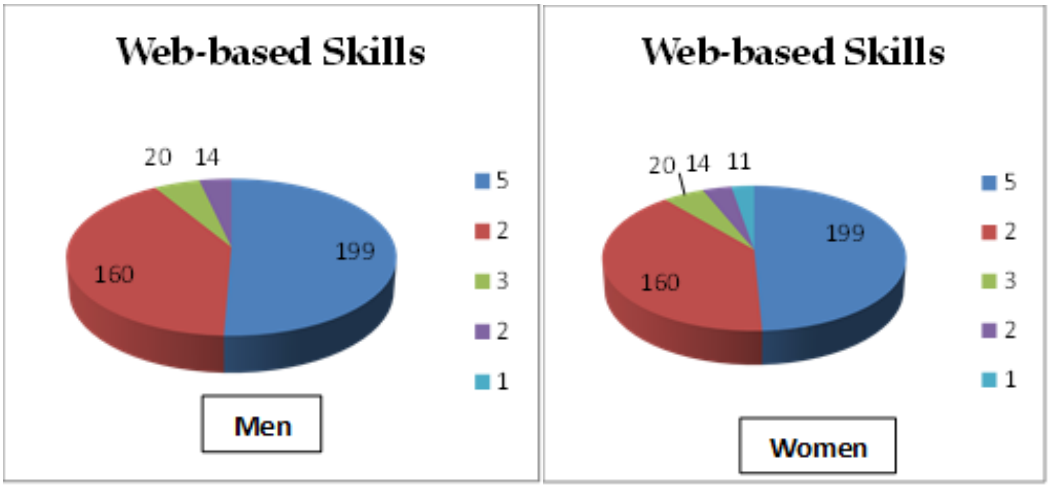

Figure. 5 Comparative Analysis of the questionnaire survey of Men and Women

It is observed from the Fig.5 that there is a strong acceptance of the fact that Problem – based website learning has helped the students gain more knowledge in web-based skills compared to the conventional mode of teaching.

The overall results of the research indicate that the Problem Based website Learning has definitely created a very positive learning climate among the students in the classroom. There are a number of reasons why it may be beneficial to implement in a classroom. It is the first and most important aspect of the curriculum that it enables the students learn skills that are usually acquired only by doing. Two abilities, problem-solving and effective communication, are given very little attention in normal education collaborate. It has been shown that student performance and understanding grow at the same time as training. Learning how to solve problems and working together with others are critical while also keeping course information in mind results in a more qualified workforce due to its ability to increase training efficiency. According to this notion, a program's curriculum and teaching should be grounded in adult learning concepts. The project presented here, which involves teaching students about global issues, is consistent with previous research on adult education and does not require any specialized technology. As a result of this approach, several of the previously described benefits of PBL training were realized.

Discussion

Numerous restrictions included in the information presented here should be kept in mind. If we want to be honest, isn't actually problem-based learning, but rather scenario training. We must first clarify what PBL is in order to compare it to other training programs and make an informed assessment of this assertion.

4. Conclusion

Problem-Based Website Learning can first be applied in one subject and subsequently expanded to include numerous disciplines, it does not require the employment of costly resources or state-of-the-art technology. Problem-based web learning can lead to the development of a whole problem-based learning curriculum later in many schools. Training sessions must be held for faculty members who act as facilitators during Problem Based Web learnings. Postgraduate students can be trained in a variety of contexts to work as facilitators. Each school must establish its own problematic learning (PBL) method, taking into account the number of students, student body composition and curriculum and assessment requirements.

A study showed that in the beginning of the semester, random performance was evident in the knowledge evaluation scores with 36 percent correct. Even though the course evaluation results show that 62 percent of students' grades improved, this degree of improvement may suggest that the course content is still not fully understood. A more traditional methodology was unable to utilise for the sake of comparison. One thing that can help us gauge success is that students' grades remained the same despite their knowledge assessment results. The students might not have had the motivation to do well on either of the tests. Otherwise, the low performance on the knowledge assessments is likely related to the fact that they were the only closed-book exams in the course. By being allowed to use their textbooks and notes, students might complete regular, online assessments. This concept is aligned with Reynolds' (2006) hybrid classrooms by encouraging a blend of traditional and PBL teaching methods using website. For classes with a maximum student number of about 30, each activity takes about 30 to 45 minutes, allowing for the activities to be used in the majority of classes.

It would take longer to hand in oral reports if the instructor wanted to include oral presentations in a course that was larger. In addition to the activity guide and self-assessment evaluation form, there are no further resources needed for the activities, as the items required are available from the author. Examples of how a course on feeling and perception may include active learning approaches are available here. Future research might compare the performance of students in a PBL section with those in a more typical classroom group, or it might look at how students' performance changes with PBL in relation to more traditional teaching styles. This research constitutes a first step in devising and implementing practical and relevant problem-based website learning activities that apply to physiological and cognitive psychology courses as well as to actual-world application of study content. These preliminary data suggest that web-based PBL could be a valuable teaching method in these courses.

Problem-based website learning is a new method of learning in some regions of the world, but PBL is employed in others for more than two decades. PBL uses adult learning approaches and focuses great emphasis on the ability of children to learn by them. In order to excel in school, students are required to become more involved in their own learning. There are pros and cons to using PBL. Most Asian students are dedicated employees who perform well in groups. They are, nonetheless, reserved and perceive the teacher as an authority figure. Many Asian institutions have integrated problem-based learning effectively (PBL). A variety of settings have updated and implemented web-based PBL. Other techniques to learning are also being developed.

To conclude, the above research shows that problem-based website learning is an effective teaching and learning technique, especially when it is assessed for the conservation and application of information. One of the weaknesses of earlier research on the efficacy of web-based PBL is that the studies tend to focus on training. But, contrary to traditional knowledge, an increasing number of experimental investigations in diverse topics are

progressively showing that students who learn in PBL environments exceed those who study in lecture environments. If we consider what stages or components of the PBL process have an impact on the learning of students, then causal modeling suggests that the PBL process is significant for predicting students' learning, as outlined in Problem based Literature, which begins with the problem analysis.

It is unproductive to simply have a collaborative component or only a self-directed learning component. On the other hand, another study shows that the level of student participation in the problem is sufficient. Improve student learning performance compared to traditional strategy and the collaboration part have failed. Make a considerable influence on student learning. Consequently, stricter controlled experimental study is needed to uncover the full extent of the phenomena.

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