

Using a Virtual Learning Environment for Problem Based Learning (P.B.L)

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Abstract –PBL Problem-Based Learning (PBL) may be a method during which advanced real-world issues square measure is used as the vehicle to market student learning of ideas and principles as critical direct presentation of facts and ideas. In addition to the course content, PBL helps to market the event of essential thinking skills, problem-solving skills, and communication skills. It also can offer opportunities for operating in teams, finding and evaluating analysis materials, and life-long learning. PBL is powerfully fundamented in well outlined principles. On the opposite hand, several academics and students implement PBL, while not the mandatory theoretical and sensible base for the academic changes and acceptable technology resource support, creating it less economical. In short: PBL is all concerning you, your tutors are very approachable and you learn along in an exceedingly dynamic manner, serving to kind you into associate degree assertive skilled. This paper gift concerning PBL Guide that promote technological support to associate degree array of actions into the principles and characteristics originated from learning theories concerning PBL.

Keywords: Problem-Based Learning ; Virtual Learning Environment ; Moodle ; Ubiquitous learning Environment ;PBL Guide ; E- Learning.

I. INTRODUCTION

PBL is defined as an instructional method of teaching and learning, which is able to develop the ability to apply diverse knowledge to solve problems, through teamwork and individual attitudes as self-initiative, critical vision and reflection of the learning process, conforming its principles.[1]. PBL teaching approach is based on the student assuming an active role on the teaching-learning process through observation, experimentation, comparison and teamwork within real learning contexts and environments.[2].

One of the main challenges found on the implementation of the PBL approach is the difficulty on building and sharing collective knowledge from teamwork, allowing the professor to assist each associate individually ,continues saying it is common knowledge that tutors face difficulties in fairly assessing individuals within groups as some students choose not to contribute. These disagreements may lead to unwanted tensions within groups and may force some students to disengage and take the free-rider route.

PBLs principal goal is to meet the students where they are and putting them to work to solve real-world problems and marks a significant shift from old educational models. It provides an encouraging learning environment for teamwork involving, tutors, professors and students, developing a great capability for analysis and problem solving.

Organization. The rest of the paper is organized as follows: Section 1 includes the Introduction, Section 2 provides background information on PBL. Section 3 looks into the objective and the problem definition of PBL. Section 4 provides a discussion of the related research works. Section 5 presents the proposed system, methodology and section 6 deals with technological resources and interfaces and analysis of results in detail and concludes the research work in Section 7.

II. BACKGROUND

Problem-Based Learning (PBL) is a curriculum development and delivery system that recognizes the need to develop problem solving skills as well as the necessity of helping students to acquire necessary knowledge and skills. The first application of PBL, and perhaps the most strict and pure form of PBL, was in medical schools which rigorously test the knowledge base of graduates. Medical professionals need to keep up with new information in their field, and the skill of life-long learning is particularly important for them. Hence, PBL was thought to be well suited for this area. Many medical and professional schools, as well as undergraduate and graduate programs use PBL in some form, at varying capacities internationally [3]. There are several organizations that provide support for teachers and students of PBL and others that research PBL and related topics.

III. OBJECTIVE

The objectives of PBL system are;

- i) Self directed learning : Through tutorial sessions the students are taught to self-formulate their goals and objectives of learning of particular topics and then at the end of each session they are expected to evaluate the extent to which their goals are realized;[4]
- ii) Problem solving : This encourages students to increase their motivation to learning, critical thinking, writing and also to enhance communication skills. This may be through the medium of case scenario where students analyze the information and come to a conclusion; [4]
- iii) Team work : The students are required to work together and cooperate with each other during discussion.[4]

3.1 PROBLEM DEFINITION

The digital education initiative is alive and well and part of the reason why there is such a demand for digital education is the idea that traditional education has a number of shortcomings that are making it less accessible for those that are most in need of up skilling and educational programs that will help them further their career.

The traditional educational system suffers from the following drawbacks

- 1.Student’s become overdependant on the teacher.
- 2.Student’s are defiant ,rowdy or distracting, bored, inattentive/ unmotivated of others.
- 3.Student ‘s are unclear what to do ,or they do the wrong thing.
- 4. Problems resulting from the course book: pronunciation and translation activities.
- 5. Lack of support in terms of materials and equipments : audio-visual aids /supplementary materials.

IV. RELATED WORKS

Problem based learning: Definition and distinction. Interdisciplinary journal of problem based learning [5].

It is an instructional learner-centered approach that empowers the learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem. This overview presents a brief history, followed by a discussion of the similarities and differences between PBL and other experiential

approaches to teaching , and identifies some of the challenges that lie ahead for PBL.

x PBL: A Methodology for managing PBL when teaching computing[6].

This methodology consists of the elements that enable a learning environment to be built that in its essence is practical and contains real learning, and that ensure that this is supported by processes that make it possible to evaluate the effectiveness of the PBL approach from various perspectives: namely, the student’s , the teacher’s and that of the methodological approach itself.

Problem based learning : A strategic Learning system Design For The Education Of Health Care Professionals in the 21st Century[7]

PBL is essentially a strategic learning system which represents a major shift in the educational paradigm from the traditional teacher-directed (teacher-centered) instruction to student-centered (learner-centered) learning, a paradigm considered more appropriate for the educational preparation of students in the 21st century. Implementation of PBL can be a tremendously daunting task: not only will it require a clear understanding of the strengths and limitations of PBL, but also a significant change in the mind sets of students and teachers. Implementation of PBL is likely to cause some difficulties, including discomfort and agitation to both teachers and students, especially in the early phase of its implementation, and in those institutions deeply entrenched and entrapped in the traditional teacher-directed and highly discipline-specific curriculum.

V: PROPOSED SYSTEM

The proposed system (See Fig 1) helps the teachers and students in the implementation of an authentic learning process with useful and relevant technological support. PBL brings a collaborative and interactive learning process between all the participants. PBL-Guide is a ” Virtual Learning Environment (V.L.E) to support PBL in bringing the 3D virtual world elements to promote a rich interaction between students and teachers.

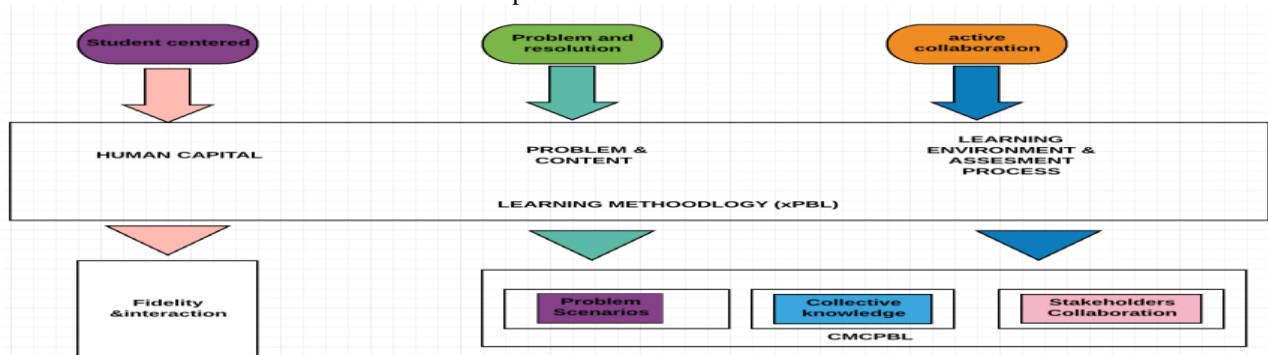


Fig 1 : Architecture of the Proposed System

5.1 METHODOLOGY

The three learning principle consonant that are involved with the PBL approach are the following

- a. **Student Centered Environment** : These involves the learning students and the participants who are involved in the PBL approach who gains knowledge and share their potentials and resources with the others.
- b. **Problem and Resolution Environment**: These provides an environment that allow the problem proposition, discussion, understanding and development.
- c. **Collaborative environment** : It stimulates the interaction and immersion of everyone involved on the teaching-learning process.

5.2 PBL-Guide and PDCA Cycle

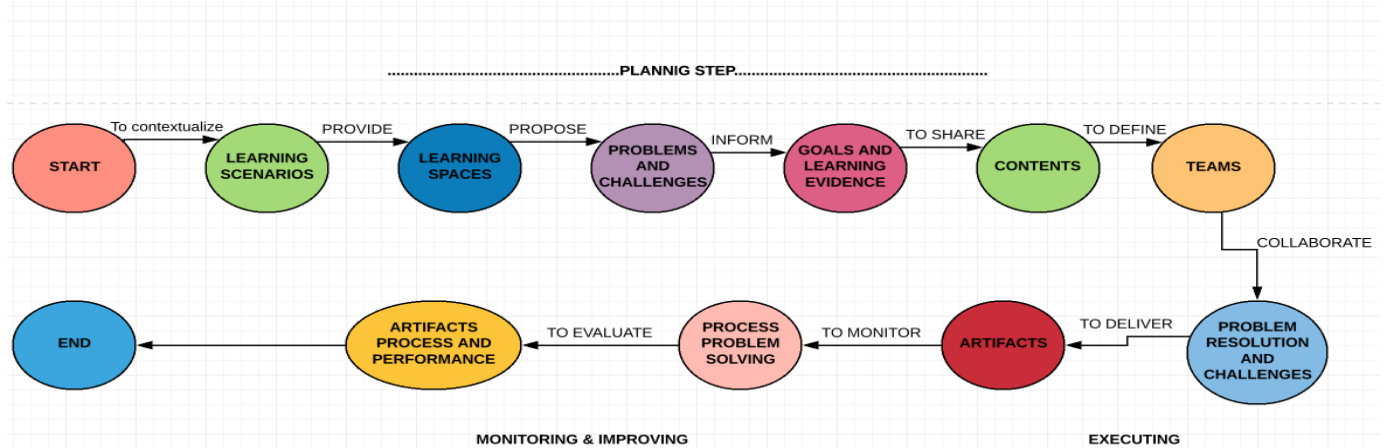


Fig 2 : Set of Activities

Before describing the main activities in the technological resources and interfaces of the PBL-Guide , the set of activities that are included in the management of the teaching and learning cycle should be made clear, since they rely on the PDCA cycle as a benchmark and there is a relation between these activities and the PBL principles.

The explanations set out in Figure 2 are explained in the following paragraph which displays the activities and the ways they can be described. These activities are carried out

in the PDCA cycle to ensure that there is a standardization of each stage, as it is started, developed and completed, for both the teacher and the students.

The ten sets of activities of the PDCA Cycle mainly falls under the three steps namely, the first 5 activities falls under the Planning step, the following 3 activities falls under the Executing step, and the remaining activities under the Monitoring and Improving stage.

Fig 3 : Description of Activities

S.No	ACTIVITY	DESCRIPTION
1	Learning Situations	Teacher must contextualize the learning Situation and the students should be enabled to interact in learning and teacher must support the student while working in a complex situations.
2	Learning Spaces	Teacher must provide a space for the students to do research and must share technology.
3	Problem & Challenges	Teacher, client &tutors should set the problems that challenge the students. Challenging problem involve a wide range of activities and draws various kind of information.
4	Goals & Evidence of learning	Teacher should define the learning objective, It involves describing knowledge & skills that must be demonstrated by the students (how to tackle problems?)
5	Teaching Contents	Teacher must share the text based files, Presentations (ppt's) , spreadsheet's etc [8]

Fig 4 : Description of Activities

6	Teams	Teacher should form heterogeneous teams (Different skills of the members can be combined to achieve the result)
7	Challenges of problem solving	Student must disclose his knowledge ,draw facts, suppositions & ideas with respect to the problem.
8	Artefacts	Student must write web-based documents, create spreadsheets, give ppt's among different works.
9	Problem solving (Monitoring stage)	Teacher must find the difficulties of the student with problem solving activity. She must provide feedback & check the solutions arrived by the teams.
10	Problem solving (Continuous – Improvement stage)	Teacher must assess the lesson contents, procedures and artefacts of the students.

VI. TECHNOLOGICAL RESOURCES AND INTERFACES

In the following section, there will be an examination of the technological resources and main interfaces that offer support to a set of structured and measurable activities based on the principles and key elements of learning theories about PBL.

A. Teacher Module

Carry out the planning and management of the following: Learning scenarios, problems, challenge-problems, learning objectives, evidence of learning, teaching content, the learning environment, teams, the monitoring of the learners to detect if any learning difficulties are being encountered and also determines if the educational objectives are being achieved.

B. Student Module

Allows the student to produce a challenge-problem, suggest a means of tackling the problem, carry out tasks and create artifacts and works in a collaborative way.

C. Interface for the Management of Problems and Challenges:

Stores the problems in a shared repository and carry out searches that cover a wide range of information of interest and visualise the problems through specific information contained in the guidelines and to plan or choose new problems on the basis of pre-existing problems.

D. Interface chart for the Analysis of Solutions :

It provides a framework which establishes the analytical procedure for monitoring how students find solutions to problems and also offers the students a means of thinking about a problem in depth and reaching a conclusion by means of the following sequence of stages.

- I. Ideas : possible ways of solving the problem .
- II. Facts : information that has a bearing on the problem.
- III. Suppositions : raising questions about learning to help solve the problem.

IV. Action Planning :strategies , resources, and information, i.e whatever can assist in finding a solution.

6.1 Analysis of Results

1. Curriculum Exploring and Team work :

The students had access to the internet, so they chose their sources. The information exchanged was also stimulated, when at the end of the classes the students would share with the other groups what they had found, inspiring the other groups in their research. This way, every group found different solutions , that were validated with the teachers through PBL-Guide.

2 .Problem Solving and Presentations :

After creating the prototype that solves the proposed problem, students presented their work to the other groups. By following the other groups presentations, all students obtained a complete learning and also got a final feedback from the teachers by explaining their findings and answering questions related to the study topic.

VII .CONCLUSION

PBL enables the students to consolidate their knowledge, stimulate their creativity , critical thinking and communication and problem solving skills. PBL system is actually a kind of flexible teaching method and allow students to go really depth into one of the specific topics. PBL provide right information, It could be either from the internet/journals. One can see the research results and can analyze them critically and can integrate and can find the right decision. The constructs for teaching PBL are very different from traditional classroom or lecture teaching and often require more preparation time and resources to support small group learning.[9]

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