

Platform context

At the end of the learning process, students seem to have a growing concern about transitioning the skills and abilities they acquired during their undergraduate course to please the needs and demands from companies. Many studies highlight that applying engineering courses into a real-world practical context brings many benefits to students.

Several engineering courses around the world have been acknowledging this scenario and therefore look forward to cooperate with corporations in employee development, creating a profile aligned with the professional practice. They adopt the Project Based Learning (PBL) method, which embraces them subjects as well as undergraduate final projects developed by students.

The PBL aims to make students apply theoretical knowledge acquired in engineering into solving real issues, in which they participate during all stages of project development, from planning until closure, assuring an articulated vision between professional performance and different areas of knowledge, allowing the understanding of the diversity of determinant aspects involved in problem solving.

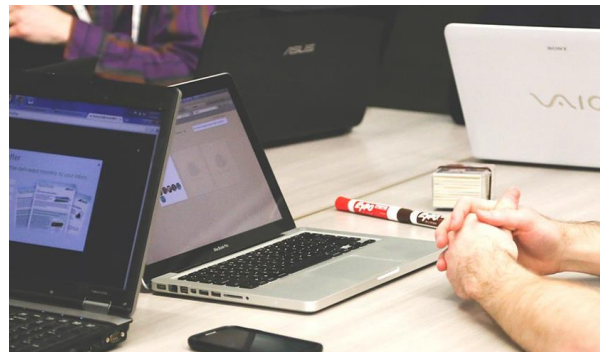
The Project Based Learning (PBL) method is a pedagogical strategy centered on the student. This method is related to constructivist theories where the necessity of a systemic and generic focus makes the knowledge not absolute, that means the student, with the professor, has the power of build a global perception about the subjects.

Companies' real problems, whether they are private or public, large or small, manufacturing or service companies, provide input to the themes which will be worked in subjects and in eventual undergraduate final projects.

The biggest challenge in this methodology is to assess the efficiency of its implementation. The importance of consolidating this assessment method is that it will contribute to ensuring that the course provided by a university, which aims to prepare the student of engineering is in accordance with the demand of the labor market.

In this context, Unified Platform of Active Methodology (PUMA) project was created. Thus, the objective of this project is to develop a system that allows us to measure the teaching process currently used and to provide substantial and reliable feedback and information for the redirection of subjects over the years, not just to follow the market requirements, but also to always be aligned with the expectations of everyone involved in the course.

What is the PUMA?



P - Platform

U - Unified

M - Methodology

A - Active

This platform is

being developed to support the application of the PBL method along subjects at universities. PUMA is a platform centered in academical culture and encouragement towards using Information and Communication Technology (ICT) as a useful instrument to measure the efficiency of the PBL method, feedbacks as well as substantial and safe information to redirect PBL subjects across the years, besides watching market demands, and maintaining the course always aligned to the stakeholders expectations.

It can be understood that the PUMA Platform is a tool that integrates input and results of the projects developed by students along the undergraduate course, being the entrance door to the stakeholders' demands to be studied by students in real problem solving, by the project submission functionality.

PUMA platform is being developed by a multidisciplinary team composed by three Engineering areas: Software, Production and Computational.

The development of this platform is justified

as the projects developed by students through PBL disciplines are part of a bigger organization, universities, where they could have an effect on the fulfillment of their aims, as they lead to products or services which reflect on results to the society, which is a main client of undergraduate courses.

General Objective:

The general objective of the project is developing an IT system, called PUMA, it allows the automatization of the whole students' assessment process, covering all the PBL subjects.

Specific Objectives

The specific objectives of the PUMA project are:

- Disseminate the results of the best projects;
- Maintain a base of stakeholders;
- Evaluate the satisfaction of stakeholders with the projects delivered;
- Increase the number of stakeholders through the facilitation of project solicitation;
- Automate the students' evaluation process;
- Evaluate the evolution of the students' performance regarding the techniques and cross-cutting competences in the disciplines of PSPs;
- Measure the efficiency of the teaching methodology (PBL).

The PUMA project was divided in modules aiming to smooth its development.

Structure of the main modules

Developed: In testing and improvement in Brazil

DISCLOSURE - MODULE 1

It aims to capture stakeholders and work with projects in problem solving through the PBL methodology.

- Dissemination of PBL initiatives of the best projects and news;
- Public notice disclosure for submission of project proposals;
- Management of the dissemination page.

PROJECT MANAGEMENT- MODULE 2 (Part 1)

It aims to identify the problematics of the stakeholders and select those which will be solved by students.

- Submission and evaluation of proposals;
- Selection of proposals (Acceptance or Rejection);
- Send feedback to the stakeholder with the result of the evaluation.

To be developed: Partnership with Tunisia

PROJECT MANAGEMENT- MODULE 2 (Part 2)

The second objective is to structure the discipline for the students to take action in the selected projects.

- Assembly of discipline
- Dissemination of themes and problems
- Team selection according to the projects/themes
- Direct the problem to be solved at the specific discipline

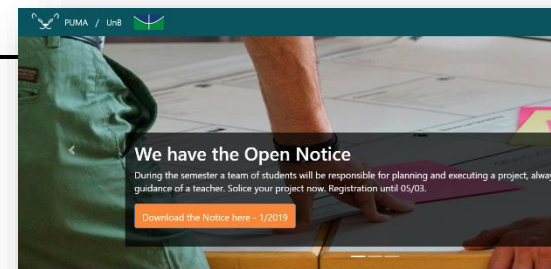
EVALUATION - MODULE 3

The goal is to measure the performance of the students' cross-cutting competences, through a peer evaluation and to generate the individual final score of each student.

- PEER Configuration
- PEER Filling
- PEER Calculation
- Automatic calculation of the final grade considering the PEER evaluation

The platform has at macro level the following future phases:

- Maintenance of a base of external agents (stakeholders), in order to maintain contacts for future needs of universities.
- Automation of the project screening process in order to select projects and research of best interest from universities;
- Integration with the projects already existing at universities, through webservice, such as disclosure of evaluations, grades, login and others;
- Issuance of reports according to the needs of faculty and students.



Project Submission

What is the title of the project? *

What problem do you want to solve in this project? *

What goal do you want to achieve with this project? *

Application Area *

Database Analysis

PDF link *

Type of Submission *

Physical person ☒

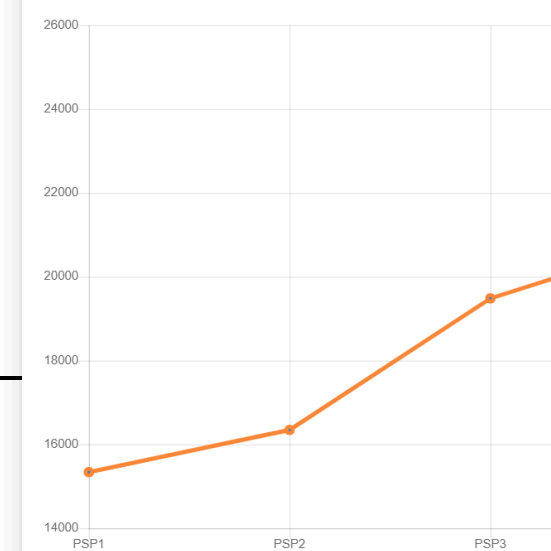
Legal person ☐

[Submit Project](#)

* Required field



My Performance - Leadership



My Projects

PSP	Title	Problem
PSP1	Dok Brasília Hotel	Based on customer review

Partnerships and results expected

Brazil (University of Brasília - UnB)

The Production Engineering course of University of Brasília (UnB) looks forward to cooperate with corporations in employee development, creating a profile aligned with the professional practice. It adopts the Project Based Learning (PBL) method, which embraces its eight Production Systems Project (PSP) subjects as well as undergraduate final projects developed by students.

The course of Production Engineering of UnB has a curriculum based on the PBL method to capacitate the engineers to solve problems in a holistic vision. The pedagogical strategy thus sought to ensure an articulated view between the characteristics of professional practice and the different areas of knowledge, allowing to understand the diversity of determinant aspects involved in solving science problems in question.

The PSP disciplines of UnB are based on learning from the active participation of the student, who executes a project by learning to work in teams, applying in practice the knowledge acquired in other subjects, among other factors that simulate the reality of the basic activities to be performed by a production engineer in the execution of projects.

Therefore, the first stage of development started in Brazil in 2018 and was funded by the University's Distance Learning Center. At the current stage of development, Brazilian students are researching how to use the results of the PEER evaluation and self-assessment in the creation of PBL teams and application of text mining techniques to assignments of projects proposals which aims to suggest the placement of the projects in PBL subjects through a training a model using text mining techniques to execute project assignment automatically, in which it would distribute the projects to a PBL subject lectured by a professor that has knowledge and experience to advise the students solving these projects. In addition, the Brazilian team is eliciting new requirements, testing and refining the PUMA modules on PSP subjects, writing articles and seeking new partnerships with other countries.

Partnership with Tunisia (Higher Institute of Engineering and Technology (ESPRIT))

This partnership started at the 11th International Symposium on Project Approaches in Engineering Education (PAEE) and 16th Active Learning in Engineering Education Workshop (ALE) in Tunisia. The functionalities of the PEER Assessment and the self-organization teams are being development by Tunisian students (divided into two development teams) in partnership with Brazilian students. In addition, a workshop about PUMA is being planned at PAEE'2020, which will take place in Thailand.

Partnership with Denmark (Aalborg University)

The objectives of this partnership are refinement of the PUMA modules already developed and the ones to be developed, joint study groups, advancement researches in the students' evaluation area, tests in disciplines at Aalborg University and participation in the publications and dissemination of PUMA.

Results expected:

- Increased cooptation of stakeholders for an elevation and diversification of the topics addressed in the PBL disciplines;
- Monitoring the performance and evolution of students throughout the PBL subjects based on cross-sectional assessments;
- Screening of projects in order to select those most relevant to research and needs of the universities;
- Obtaining feedback from students, teachers and stakeholders to improve the subjects.
- Maintenance of a stakeholder base;
- Issuance of reports and indicators of the PBL disciplines, students and professors;
- Integration between IT systems of universities, in order to avoid rework and information duplication;
- Interaction between students and professors of several countries, through the PUMA platform.