

The Authentic Assessment Series: A guide to implementing Problem or Project Based Learning (PBL or PjBL)

This guide will assist you in developing and administering project-based learning assessments.

PBL/PjBL Overview

Problem based or project-based learning offers students the opportunity to experience deep learning through the undertaking of an authentic and industry relevant task e.g. either through investigating and solving a real world problem or to produce a tangible model, prototype, design, or industry solution through a project.

Why do it?

Quite simply, providing students with assessment activities that have value, are important to the learner and their own objectives, you are well on the way to motivating students through their assessment.

Biggs and Tang (2006) outlined two clear ways to motivate students:

1. It has to be important... have some value to the learner.
2. The learner needs to expect success when engaging the learning task.

Industry too has an expectation that we have provided our students with practical skills and graduate attributes so they may step seamlessly into the modern workplace after their studies. They tell us they require students with critical thinking, problem solving, and communication skills amongst others. Exposing students to projects and problems to build these skills while they are with us, is mandatory.

How to do it?

To design projects that inspire and engage students, there are some key elements for a successful implementation; align to the course/program learning outcomes; ensure activities are well managed, resourced, and monitored; scaffold the learning; build in reflection and formative assessment into synchronous class time; and coach students in how to conduct the projects.

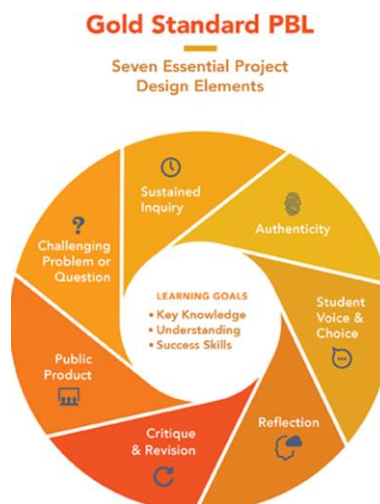


Image 1. Gold standard PBL, <https://www.pblworks.org/blog/gold-standard-pbl-essential-project-design-elements>, accessed 18 May, 2021

Follow these steps to design your project.

1. Design your project to align with the Course Learning Outcomes; reflect on these, what type of projects do they inspire.
2. Consider what skills students require to successfully complete the project e.g. critical thinking, team building, problem solving skills or project management skills. Build these into your classes to scaffold the learning. Concentrate on a couple of these per project in early stages.
3. Design the project at a level appropriate to the students' level of learning (see the section on scaffolding below).
4. Ensure the project is inspiring, open-ended, and allows for alternative solutions.
5. Design it to be sustainable throughout the semester, allowing appropriate time to reach a successful conclusion and reflect and evaluate at the end.
6. Design it to be student-centred with a level of independence in solving the problem; they are in command of their time, resources, and final product.
7. Design your project to relate to real world problems and the experiences of practitioners in the field.
8. Build in ongoing formative feedback, self and peer reflective activities throughout the course to provide a solid learning experience.
9. Showcase the end products and schedule time for students to explain their decisions to their teachers and colleagues. Final products are given the opportunity for wider exposure than just the classroom; this could include related community or industry groups.

Adapted from BIE, Gold Standard PBL, Essential Project design elements, http://bie.org/blog/gold_standard_pbl_essential_project_design_elements accessed 17 May, 2021

Scaffolding the learning throughout the program

PBL/PjBL should be a program-wide approach so graduate attributes are built over time.

An example of an approach in a 4 year Program:

Level 1 - Present the problem in manageable chunks to students, planning the scaffolding of all skills and knowledge required throughout the course. Develop the project in a way that is heavily instructor led with much support to develop strong teamwork and good communication.

Level 2 - In the second year, also present the problem in manageable chunks but begin to allow students a greater degree of independence as they progress.

Level 3 - By third year, students should be working towards being a little more autonomous. By now they should know how to develop their teams and easily adapt to using a range of communication tools and project management tools (see Online Environment ideas below). Projects could also begin to be more holistic in approach, perhaps a number of courses can be aligned to one project for holistic assessment with two or more academics working together on one major project.

Level 4 - By the final year, students should be working towards being work-ready. Projects should be real and challenging, perhaps work with industry or community groups to design something with a real-world need. They could be multi-disciplinary and multiple courses could use the one project for the assessment. This could be a capstone project.

Scaffolding the learning throughout the course in the blended learning environment

Action	Benefit
One Note files to be created by all teams and shared with teacher/team/class	Teacher can view work at any stage if concerned. Students showcase work from the beginning and feel an immediate sense of pride. Peer feedback and discussion on developing projects built into synchronous sessions inspires better outcomes.
For teamwork, teams create a Teams folder to share with the group and teacher	Teacher can see what each team member has contributed and can encourage less active students to increase input.
Online weekly progress updates and reflections (this could be done as a Discussion Board encouraging peer feedback)	Teacher can review these prior to synchronous sessions and discuss any noticeable problems in the synchronous session. For students, ongoing reflection can focus their way forward.
Set up formal project check-in meetings with project teams at least twice during the project. This could replace synchronous sessions.	Helps to keep projects on track and provides time for ongoing feedback. Using the aforementioned progress update and reflection should help to minimize the time required.
Build group project sharing into synchronous classes to share project ideas e.g. do a group SWOT analysis	Devise synchronous session activities where students share their project ideas and get feedback from each other.
To start the project, invite industry guests to share their project stories and what is currently required in industry	Students love hearing from industry. Inviting guest speakers at the commencement of the project makes an inspiring start and connects students with real-life problems so they understand the relevance of their assessments.
Each week provide micro lectures on the knowledge required to complete the projects successfully	It is important to not only scaffold the discipline learning but to ensure students have the skills to complete projects successfully too. If you are grading on communication skills for example, then provide some learning materials in micro-lectures on Canvas.

Building employability skills in the blended learning environment

This table demonstrates the expected employability skills being developed in PBL/PjBL and a range of technologies to assist.

The skills	Technologies to assist
Technology	Trello is a helpful online project management tool students can use to divide out tasks https://trello.com/ See an overview here for using Trello for PjBL.
Problem solving	Mind mapping is a good way for students to commence the problem solving for a project; there are some excellent online tools for this, one to try is Coggle.it , this online mind-mapping tool can be shared with all members of the teams to brainstorm connections and ideas.

Communication	Part of the joy of a project is sharing the findings; there are many online resources that students can use to share with the class or industry when completed. PowerPoint, screen-casting, or infographics are all different modes of presenting findings, let your students explore. Teams is helpful for online meetings or inviting industry into class to discuss projects.
Teamwork	The most effective way of keeping teams on track is to ensure good communication and to have regular meetings. If students keep all shared project documentation in OneNote and in their MS Team space, it will reduce problems. Ongoing meetings can be set up in the Team calendar at the start of the project to fix schedules and good habits early on.
Initiative and enterprise	Helping students to come up with creative solutions to problems is key to exciting, innovative designs; design thinking assists in developing ways to assist students. This article on ‘45 Design Thinking resources for Educators’ is helpful to establish some ways of doing this supported by technology. Online sticky note resources can be helpful too for students to brainstorm their approach to a project try Padlet or Miro.
Planning and organisation	Planning tools like MS Planner or Trello are helpful to keep teams on track. Independent research can be shared by creating an online reading list for the group using a social bookmarking tool like Diigo. Diigo allows students to save their own independent research but also to create reading lists for the group, very helpful in team projects so all have access to all readings and the teacher can see who added what to the group list; helpful from a grading point of view.

Stories from our classrooms

Holistic cross-discipline projects

STEM Ecosystem Project – The Katherine Project: Watch [this video](#) to see how inspiring PjBL can be. Note that it need not be only in your discipline or course, taking an holistic view of how the job would play out in industry and who else would be involved, paves the way for cross-discipline, real industry projects.

Single course project with industry projects

[Model activities for inclusive teaching: Inquiry Based Learning](#)

Global industry holistic project

[Fiji study tour: The story for RMIT Teaching Awards](#) - This video tells the story of a study tour students can undertake to participate in a real industry problem to solve contaminated water issues. A similar activity could be created as an assessment or you could permit students to negotiate their assessment and they come up with similar ideas for a project by aligning the course learning outcomes with the proposed activity.

