

Exploring the Benefits of Project-Based Learning for Students

in a Québec Secondary Mathematics Class

Background

What is Project-Based Learning (PBL)?

Project-Based Learning (PBL) is a student-centered pedagogy that allows students to investigate authentic problems or questions connected to their real life.^[1]

Through PBL, students solve the problems by

asking questions, planning investigations, and conducting research ^[2]



Context

The "Lifestyles Project" (Secondary 2 Mathematics)

Hobby assignment

Explore the mathematics involved in your hobby.

Career assignment

Imagine your future career & research the salary of your job to calculate net incomes.

Design assignment

Design your bedroom using measurements and patterns.

In each assignment, students:

1. Personalized the task based on their interests
2. Conducted research
3. Used mathematical knowledge and language
4. Decided on the formats of sharing their learning (e.g., video, essay, presentation).



Findings

Benefits of PBL for Students

1 Improved understanding of mathematics content knowledge

"Math and science will always be useful because they're in everything" (Chandi, student)



Students strengthened their subject content knowledge by doing mathematics situated in examples from daily life.

2 Enhanced 21st century skills



"Students are given a choice on how they submit their assignment. Students have to do research." (Stephanie, teacher)

Students developed their **critical thinking, problem-solving, research, design, and communication skills.**

3 Promoted collaborative learning

"I learn best when I work in groups, and I like communicating and being creative with other people and talking about things." (Raza, student)

Students learned from each other by sharing their learning with peers.



Faculty of Education

© JAO RESEARCH TEAM, 2022



Social Sciences and Humanities Research Council of Canada

Conseil de recherches en sciences humaines du Canada

Canada

[1] Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26(3-4), 369-398. <https://doi.org/10.1080/00461520.1991.9653139>

[2] Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39-43. <https://doi.org/10.1080/00098650903505415>