Project-Based Learning

A Comparison Between PBL and Conventional Teaching Methods.

Background

Project-based learning (PBL) was integrated into two 9th grade Earth science classes. Students have shown disinterest and appear unmotivated to learn science. I suspect this is from the fact that science has not been engaging but has been presented by rote teaching practices that do not engage or challenge students' abilities. PBL was used to try to improve student engagement and motivate students to understand science content in a more real-world aspect and to provide deeper mastery of science concepts. I wanted to assess the value of PBL in teaching and understanding science compared to conventional instruction methods.

Primary Question	**How will project-based learning enhance understanding of science concepts compared to current instructional strategies?**
Sub-questions	1. Does a project motivate students to learn more than current teaching methods? 2. Can artifacts in a project or the project itself be used as the major assessment during a unit rather than a summative test?

Treatment

Weather Unit

•Class 1 (PBL Group): Created Children's Book on Weather & Presented to Local Elementary Students

•Class 2 (Control): Learned Via Conventional Methods

Climate Unit

•Class 1 (Control): Learned Via Conventional Methods

•Class 2 (PBL Group): Created PowerPoint Presentation Regarding Global Warming & Presented to Community Panel

Data Collection & Analysis

Questions	Data Source	Data Source	Data Source
PBL vs. Regular methods.	Pre-unit test Post-unit test	Formative quizzes and quick-writes	Knowledge rating
Motivation of PBL vs. Regular methods	Student interviews	Student survey	Teacher journal/log
Projects and artifacts as assessment tools	4th grade book creation	Panel presentation	Summative test

Results

•Engagement during PBL determines success of post test scores and project grades

•Tracking and noting engagement during PBL helps ensure involvement, group management, as well as grading and accountability during PBL process

•High achieving students benefit more from PBL than low achieving students

•PBL Design Determines Success

- Incorporating peer review, engagement observations or tally sheets, rubric, and time for submitting a rough draft is a must.
- Allow for a learning curve and leeway when doing a large project for the first time and when students are not accustomed to a project type (Writing a Children's Book).

Comparison of post test low gain scores and engagement

	Low Gains and Unengaged during project	Low Gains and Unprepared on project due date	Low Gains on both weather and climate post tests	Low Gains on both post tests and unengaged during course of project	Mode of grades for low gain students
Weather Project Class	90%	60%	60%	83%	F
Climate Project Class	38%	0%	69%	46%	C

Note. Low gains students listed were at or below median score in both classes, (*N*=41).

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