From the Field: Practical Applications of Research

Leveraging Student Strengths through Project-Based Learning and Authentic Assessment in an Integrated ENL Classroom

By Sharron Huang and Annette Shideler

Abstract

Many project-based learning and authentic assessment studies have focused on general education students. This study includes the population of English language learners (ELLs) to contrast the benefits of project-based learning and authentic assessment for general and ENL learners.

Introduction

Project-Based Learning

Project-based learning (PBL) has been shown to have a great impact on student learning in recent years. PBL involves completing educational tasks which result in a realistic product, event, or presentation to an audience. Thomas (2000) identified five key components of effective PBL: 1. embedded in the curriculum, 2. organized around driving questions that lead students to encounter central concepts or principles, 3. focused on a constructive investigation that involves inquiry and knowledge building, 4, student-driven and managed, and 5. focused on authentic, real-world problems. Many students who had previously struggled in traditional instructional settings were often found to excel when participating in PBL instruction. This is because PBL learning better matches their learning preference for collaboration and activity type learning (Kingston, 2018).

Research has shown that student learning is impacted more deeply when they can apply classroom-gathered knowledge to real-world problems, and when they take part in projects that require sustained engagement and collaboration. Through PBL, students are encouraged to participate in active learning as they connect with and explore the subject matter. This further allows them to apply their knowledge in the world around them.

Authentic Assessment

As 21st century teachers transition from traditional forms of assessment to authentic assessments, they are constantly finding new and creative ways to assess their students' learning. Authentic assessments are any type of assessment that requires students to demonstrate skills and competencies that represent real-word problems and situations. Mantero (2002) discussed the effectiveness of using authentic assessments with ELLs, especially as they allow planning, revising discourse, collaboration among peers, and helping students 'play' within contextualized worlds inside of the classroom that are based on studied language's culture. As he explains, authentic assessments create a Zone of Proximal Development (ZDP) (Vygotsky, 1978) that accounts for cognitive and linguistic abilities and skills which allow for more self-expression, creation of meaning, and negotiation during communication.

Purpose of Study

A research brief by Kingston (2018) highlighted 20 studies that show how PBL can improve student outcomes. However, among the 20 studies, only two studies included ELL students and these studies either had no control for instruction or focused on problem-based learning instead of project-based learning. To explore the effects of project-based learning and authentic assessments on ELL students, this study compared the results of a PBL unit that culminated in an authentic assessment with the results from a previously taught, traditional, non-PBL learning unit. The control experiment was the non-PBL unit on Snowflakes, which traditionally taught students about different types of snowflakes, the science behind snowflakes, and how unique snowflakes are. The PBL unit with an authentic assessment task focused on upcycling and taught students about (a) ways to reduce, reuse, and recycle, (b) the harms of pollution and waste, and (c) ways to give discarded items a new purpose (upcycling).

The research question proposed in this study was:

1. How does the performance of ELL and general education students compare when the class receives traditional instruction and problem-based instruction?

The intended outcomes of this project were increased student performance on assessments. It was predicted that students would achieve higher marks because they would be actively engaging in real-world and personal,

meaningful projects throughout the unit. It is predicted that the stations would get students interested and motivated to learn as they see the topic of recycling and upcycling presented through subjects. It was also anticipated that students could connect more strongly to the topic as they have the choice of choosing their final project idea, therefore, they would perform successfully.

Class Demographics

The integrated co-taught 6th-grade class consisted of general education students and English language learners (ELLs) aged 11-12 years old. There were 13 general education students and 8 ELLs with proficiency levels ranging from Entering to Commanding (2 Entering students, 1 Transitioning student, 3 Expanding students, and 2 Commanding students). All ELLs were Spanish speaking except for one Expanding French speaker. Among the general education students, there were 5 boys and 8 girls, and among the ELLs, there were 4 boys and 4 girls. Classes were in-person every day of the school week and were instructed for 5 class periods every day.

Methods

To measure and observe student outcomes, students' station assignments, final project, contribution to the class project, and overall participation during the unit were evaluated. The average grades from this unit were calculated for each student individually and compared to the average of their grade from a previously taught traditional non-PBL unit. The overall class average grade on this unit was compared to the overall class average of the unit prior. It was predicted that students would perform better in this project-based learning and authentic assessment unit than the previously taught traditional non-PBL unit.

The unit was assessed through observations, networking with peers, group collaboration rubric, spelling and vocabulary quizzes, discussion, reading comprehension quizzes, and sequencing graphic organizers.

Stations

In this unit, students were reading about recycling as they learn about the upcycling process and various ways to upcycle. The unit began with an interactive presentation on recycling and upcycling followed by an introduction to the stations and activities that were assigned. Every day, students broke up into stations where they learned about recycling and practiced their knowledge in various stations. The stations were as follows:

- **Guided Reading:** Students read with the teacher in small groups about the effects of improper disposal of recyclable materials on the Earth, learned about proper recycling, and how they can make a change.
- **Spelling/Vocabulary Station:** Students studied vocabulary lists of recycling and upcycling-related terms that they would be quizzed on. Students also created Vocabulary Log slides with definitions, pictures, and wrote sentences with the words.
- **Speaking Station**: Students recorded themselves, through Screencastify®, read assigned articles about reducing and upcycling, then independently talked about the article.
- **Writing Station**: Students completed a picture-prompt writing packet in which they were asked to write paragraphs answering the assigned prompts using the corresponding pictures. These questions asked students to infer about the pictures and reflect on their own opinions. Students also formed opinions on the importance of reducing, reusing, recycling, and upcycling on the environment and defended those opinions with facts when writing letters to their parents as a part of their final reflection project.
- **Chromebook Station**: Students researched Upcycling DIY Projects on their Chromebooks and created a Google Slides Project with ideas of potential final reflection projects and the materials they would need. Students also prepared a short speech about why they chose their final reflection project idea and how it could be used. Additionally, students were also asked to complete a Google Form to answer questions about mass consumption.

Content Areas

In the stations, students learned about recycling and upcycling, then used their knowledge to research and explore ways to upcycle to create their own DIY projects. Following their DIY projects, students were asked to create a final project that was reflective and informative about recycling, upcycling, and their final products. Various curricular areas, such as ELA, science, social studies, art, and technology were incorporated in these stations for students.

Data Analysis

Tables 1 and 2 present the differences in the percent correct answers on unit exams between ELL and general education students who experience a non-PBL and a PBL lesson. In the non-PBL unit, the class attained an average grade of 78.46% with ELLs attaining an average grade of 73.45% and general education students attaining an average grade of 90.12%. The overall grades ranged from 65.32% to 100% with ELLs ranging from 65.32% to 88.32% and Non-ELL general education students ranging from 78.63% to 100%.

In the PBL unit, the class had an average grade of 88.61% with ELLs having an average grade of 79.58% and general education students having an average grade of 92.27%. The overall grades ranged from 67.93% to 99.79% with ELLs ranging from 67.93% to 88.32% and general education students ranging from 78.63% to 99.79% (See Table 1).

Table 1. Change in Percent Correct Non-PBL to PBL Test.

	Non-PBL Unit	PBL Unit	
Class Average	78.46%	88.61%	10.15%
Student #1 (Entering)	78.38%	83.51%	5.13%
Student #2 (Entering)	65.32%	77.84%	12.52%
Student #3 (Transitioning)	73.37%	77.17%	3.80%
Student #4 (Expanding)	69.41%	67.93%	-1.48%
Student #5 (Expanding)	91.10%	88.32%	-2.78%
Student #6 (Expanding)	68.59%	84.24%	15.65%
Student #7 (Commanding)	71.12%	72.55%	1.43%
Student #8 (Commanding)	70.31%	85.05%	14.74%
Student #9	100.00%	98.31%	-1.69%
Student #10	73.52%	86.11%	12.59%
Student #11	99.12%	97.03%	-2.09%
Student #12	91.90%	89.96%	-1.94%
Student #13	71.55%	78.63%	7.08%
Student #14	95.40%	89.62%	-5.78%
Student #15	88.18%	91.88%	3.70%
Student #16	84.03%	90.47%	6.44%
Student #17	80.96%	87.61%	6.65%
Student #18	100.00%	96.61%	-3.39%
Student #19	89.72%	93.86%	4.14%
Student #20	99.34%	99.79%	0.45%
Student #21	97.81%	99.60%	1.79%

When comparing the non-PBL unit to the PBL unit, an increase in grades was seen in 15 out of 21 students total; 6/8 ELLs and 8/13 Non ELLs. These increases ranged from 0.45% to 15.65%. The students whose grades increased in the PBL unit had non-PBL unit grades that ranged from 65.32% to 99.34%. The average difference of class grades between the non-PBL and PBL unit was a 10.15% increase in the PBL unit. When considering ELL students, there was an average of a 6.12% increase while the general education student had an average of a 2.15% increase. Out of the students whose grades did not increase in the PBL unit, their grades did not decrease significantly. Among the students whose grades decreased rather than increased, the average decrease was by -1.51% and ranged from -1.48% to -5.78%. The students whose grades decreased in the PBL unit had non-PBL grades that ranged from 69.41% to 100%.

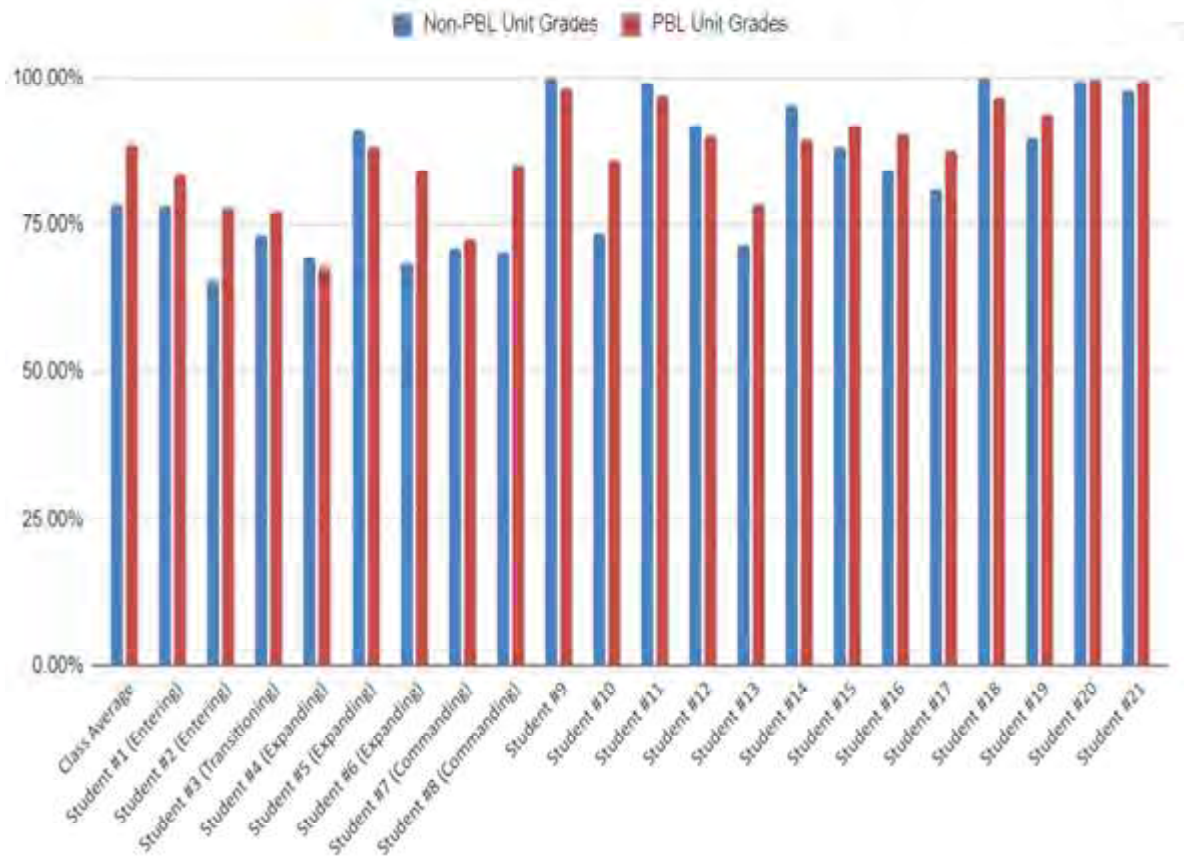
When looking at the students whose grades did not increase, it can be noted that all students whose grades did not increase in the PBL unit already had a 91% or higher grade in the non-PBL unit except for one student. The exception refers to Student #4 who is an Expanding ELL that began with a 69.41% in the non-PBL unit and ended with a 67.93 in the PBL-unit. Student #4 had a decrease of -1.48% without having had a 91% or higher grade in the non-PBL unit. However, having a grade over 91% was not directly indicative of a decrease in the PBL unit as there were two students, Student #20 and Student #21 whose grades increased even though they had above a 91% in the non-PBL unit. Student #20 had a 99.34% and Student #21 had a 97.81% in the non-PBL unit and their grades increased to 99.79% and 99.60% respectively in the PBL unit.

Discussion

The results indicate that PBL can produce an increase in student learning and participation in class material. When comparing the PBL unit to a previous traditionally taught non-PBL unit, there was a stark difference in grades. The class had a 10.15% increase in overall grades from the non-PBL unit to the PBL unit. This increase reveals that the class performed better on the classwork and assessments in the PBL unit.

The increase was more notable amongst the ELL students than the general education student as the ELLs had a higher increase in average grade from the non-PBL unit to the PBL unit. The increase amongst ELL students in grades was nearly three times the increase amongst general education students. The PBL unit also brought students closer towards closing the

Table 2. Comparison of Individual Grades and Class Averages Between the non-PBL and PBL Units



achievement gap between ELLs and general education students as there was a 16.67% difference in the non-PBL unit and a 12.69% difference in the PBL unit.

Among the students' whose grades decreased rather than increased, the difference was minimal. Additionally, nearly all the students whose grades decreased in the PBL unit had high grades above 91% or higher in the non-PBL unit to begin with. The only exception to this was Student #4 who is an Expanding ELL. Student #4 was absent for much of the PBL unit and struggled to make up work. This is likely to have played a role in the student's decrease in grade as the student had missing assignments in the PBL unit. And while Student #4's grade did not increase, the decline in grade achievement was a small decrease.

In summary, the class performed substantially better in the PBL unit compared to the non-PBL unit. The ELL students especially had a jump in academic performance during the PBL unit with nearly three times the average increase in grades compared to the general education students. The students whose grades did not increase in the PBL unit already had relatively high grades above 91% in the non-PBL unit. This level of performance may be due to their reliance and comfortability with traditional methods of teaching or it being difficult to surpass an already competitive grade. However, these students' PBL unit grades were not much lower than their non-PBL unit grade overall, students still achieved high scores.

Giving Back to the Community

The Project-Based Learning unit discussed in this study involved collaboration with the community as donations of used tires were asked from the students' families, local auto shops, car dealerships, and so on. By accepting donated used tires from the community to create an artistic planting structure with the class, the tires were upcycled instead of spending decades at a

Figure 2. Student Application of Recycling

landfill before degrading. The final planters represented the school, with the district's colors (see **Figure 2**). Making the art structure one that represents the district encouraged as well as reminded students, faculty, and other members of the school district and the larger community to recycle. By recycling and upcycling as a community, we are doing our part in helping and saving the environment. In the future, we will also be collaborating with parents when asking students to write directly to their parents and community members about the importance of recycling. Students will apply information from multiple texts to develop a persuasive argument explaining why they should upcycle at home and in the community.

Conclusion

The results of this study demonstrated that PBL has a positive influence on student learning and achievement, especially with ELLs and struggling students. The implemented PBL unit resulted in increased comprehension, engagement, interest, and assessment grades compared to a previously traditionally taught unit. Most students performed significantly better in the PBL unit where they were encouraged to participate in active learning as they connected with and explored the subject matter. When applying their knowledge through authentic assessment, students were able to attain higher scores and grades.

The PBL unit was beneficial for both ELLs and general education students in the class as there were significant increases in grades seen in both populations. ELLs had the most noteworthy increase in grades on average, which is crucial as it helped address the achievement gap between them and the general education students. The increase in performance of ELLs was related to their development of a sense of agency and ownership of their learning. They were able to enhance their language skill and scientific literacy while also learning critical content (Wolpert-Gawron, 2018).

Traditional teaching practices are no longer enough to prepare children for real-world issues. This study calls for 21st century teachers to incorporate PBL units in their teaching to guide students in cultivating problem-solving skills as PBL and authentic assessments have been shown to be beneficial for students. PBL leads students to focus on a constructive investigation through inquiry, knowledge building, student self-management, and focus on authentic questions, and critical thinking.

Authentic assessments go hand in hand with this type of instruction as they allow students to demonstrate their skills and competencies in a creative and self-expressed manner beyond test-taking. When searching for ways to improve student performance and engagement, especially in the ELL population and with students who are struggling academically, PBL and authentic assessments are the keys to closing the achievement gap and propelling students forward in cross-context understanding.

References

Kingston, S. (2018). Project based learning & student achievement: What does the research tell us? *PBL Evidence Matters,* 1(1), 1-11. http://bie.org/x9JN

Thomas, J. W. (2000). *A review of the research on project-based learning*. The Autodesk Foundation. https://www.asec.purdue.edu/lct/HBCU/documents/AReviewofResearchofProject-BasedLearning.pdf

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wolpert-Gawron, H. (2018). *PBL with English language learners: A vital need.* PBLWorks. https://www.pblworks.org/blog/pbl-english-language-learners-vital-need

Sharron Huang is a Teaching English to Speakers of Other Languages (TESOL) teacher at John F. Kennedy Middle School in Port Jefferson Station, NY, and a graduate student in the Linguistics Department at Stony Brook University in NY.

Annette Shideler is the former Director of TESOL - Teacher Preparation and Certification, Linguistics Dept, Stony Brook University in NY.