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The Best Way to Learn a Pedagogy is Practice: A Project-based Learning Journey

by Kelly Margot and Katie Worden



Kelly Margot



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American educators and researchers have focused on student-centered learning experiences since John Dewey, a progressive educator in the early 1900s, began advocating that students learn best by applying their understandings in meaningful ways. Dewey (1916) believed in constructivist teaching strategies, referring to active forms of learning in which students are involved participants building knowledge. As such, this approach allows students to apply the principles they study to construct their own learning. This approach to learning requires students to develop their own understandings as they grapple with the content—always with the guidance of a “more experienced other,” often a teacher (Vygotsky, 1978). According to the constructivist approach, learning is subjective and centers around the students’ experiences and perceptions in a social setting (Dewey, 1916; Vygotsky, 1978). These same aspects are at the core of project-based learning (PBL). PBL is an approach used to inspire and engage students in hands-on, authentic classroom learning experiences.

There is also compelling evidence to support the benefits of PBL. When examining the effects of student learning outcomes connected to PBL social studies units designed for second grade Michigan students, Duke et al., (2021) found gains in social studies and

modest effects on standards-aligned reading assessments. Additionally, research also supports the integration of reading and writing in content-area instruction, a hallmark of PBL (Goldschmidt & Jung, 2011; Vitale & Romance, 2011).

Though research suggests it is highly effective, project-based learning (PBL) can be overwhelming for new teachers. PBL is an instructional practice in which teachers become facilitators of learning by guiding students through an inquiry process that includes important components such as: authenticity, sustained inquiry, student choice and voice, reflection, critique and revision, creation of a public product, and a challenging problem or question (Boss & Larmer, 2018). This student-centered approach to learning is different from what many teachers have experienced as learners themselves in instructional models that relied on the instructor as the knowledge base and sharer of information. Professional development can help practicing teachers master a PBL approach. For example, the West Virginia Department of Education found teachers trained in PBL through professional development were more effective at teaching 21st century skills across four content areas (i.e., math, science, reading, and social studies) than a control group of similarly experienced teachers without PBL training (Hixson et al., 2012).

Research suggests preservice teachers learn to use pedagogies such as PBL by their own exposure to such learning experiences (Cai & Hwang, 2020). As a result, some universities implement PBL in undergraduate preservice programs (Goldstein, 2016; Lammert, 2020). Professors have reported that PBL increased motivation, enjoyment, and active learning when used in place of traditional lecture (Goldstein, 2016). After experiencing PBL, many preservice teachers reported that PBL teaching and learning was key to their own understanding of the pedagogy (Lammert, 2020). Tsybulsky and Muchnik-Rozanov (2019) found using PBL during the student teaching experience helped shape the professional identity of future educators, including their self-confidence, empowerment, and professional growth. Another study found the effects of implementing PBL during student teaching were statistically significant for increases in preservice teachers' self-efficacy and achievement (Mahasneh & Alwan, 2018).

Although preservice teachers do find value in learning to teach PBL units, they are often concerned about support by future colleagues and administrators as well as the availability of resources for implementation (Viro et al., 2020). Additionally, many preservice teachers believe ongoing collaboration with fellow experienced PBL teachers is important to their own success (Viro et al., 2020).

Providing intentional learning experiences with PBL within preservice courses may lead to increased teacher self-efficacy with these practices (Mahasneh & Alwan, 2018). Just as knowledge is constructed during PBL for the learner, preservice teachers construct their own learning and knowledge about teaching as they participate in preservice teacher education. Moreover, in addition to experiencing PBL learning opportunities for themselves, preservice teachers need opportunities to practice implementing PBL in classroom contexts for their students.

Based on our experiences as a teacher educator and a preservice teacher working together to build PBL capacity in an urban school system, we describe the role of the teacher educator and then that of the

preservice teacher, noting specific benefits of providing intentional PBL training and practice opportunities for preservice teachers.

Role of the Teacher Educator

I (Kelly) am a teacher educator at Grand Valley State University (GVSU), a large, regional state university with a four-year teacher preparation program. At GVSU, teacher candidates complete full-year internships. The first semester of the internship includes a teacher assistantship, a 16-week, half day internship in a K-12 classroom, with courses in the afternoons and/or evenings. During this assistantship semester, teacher assistants observe and teach a minimum of two weeks over the course of the semester.

During the final semester of the internship year, preservice teachers complete student teaching, a semester-long internship wherein the student teacher takes over the classroom for six to eight weeks. As part of their preservice teacher preparation, GVSU also offers another experience to its students: the opportunity to be a counselor for a summer camp, ExCEL (Exploring Careers in Education and Leadership), supporting rising high school seniors at a local high school who are exploring the education field.

I worked together with a team of colleagues to implement PBL into our teacher education program as part of a three-year grant through PBLWorks, one of the largest trainers of educators in the country. PBLWorks uses a "project slice" that engages participants as learners during a project as the entry point for their PBL 101 professional development. Our PBL grant also provided training for preservice teachers on understanding and using PBL during instruction, and I witnessed the need for preservice teachers to be empowered by this type of pedagogy to transform learning in their classrooms.

During the three-year grant cycle, I served as a "lead" on the PBL grant, which meant that I facilitated all the year-long trainings conducted by PBLWorks and ensured all placement supervisors were trained. The mentor teachers also attended all trainings to "sit beside"

the preservice teacher as they planned their PBL unit(s). Additionally, I participated in the professional development sessions alongside the student teachers and mentor teachers. All parties having the same training in PBL implementation was key to the student teachers' success with their units. In order to recruit high-quality mentor teachers, we asked principals to recommend educators who would be open to supporting a student teacher and PBL. We integrated PBL learning across all phases of the teacher education program to give preservice teacher candidates multiple opportunities to experience and practice PBL. We invited preservice teachers to design multiple PBL units, some in collaboration with mentor teachers and some on their own.

As an experienced PBL instructor and teacher educator, I learned first-hand that experience as a learner during PBL is key to understanding how to teach using this pedagogy. Working with preservice teachers during this three-year grant cycle, I can attest that the opportunity to participate in a project helped preservice teachers feel that “messy middle” of the project when so much choice and autonomy is placed on the group members (Boss & Larmer, 2018). Problem solving and working through the “messy middle” helped our preservice teachers build better, stronger PBL units.

Preservice teachers also understood the role of facilitator after being a PBL learner and determining when and how assistance was needed. For example, preservice teachers began to see the importance of the “mini-lesson” to provide small bits of direct instruction “just in time” for students when they needed it during the project (Margot & Melin, 2020). Ultimately, preservice teachers experienced true pride at the end of each year of the grant because they were able to tackle the challenge of creating and then teaching their own PBL units in their student teaching placements.

Role of the Teacher Candidate

I (Katherine) attended GVSU for my teacher preparation program. During the teacher assistantship at GVSU, I took a course about content literacy. Near the end of that course, I completed a module about PBL. The

seven gold standards of PBL unit design seemed like a huge leap away from a traditional learning model. PBL seemed too overwhelming for a preservice teacher to undertake. However, the seed had been planted. Shortly after completing the module, I applied and was chosen for a one-week job as a counselor for the ExCEL summer camp. The idea of introducing and executing an entire PBL unit in a week seemed impossible, but I was ready for the challenge.

The original, desired outcome of ExCEL was to provide opportunities to high school students, mostly first generation college students, to better understand higher education and to explore the teaching profession through an education camp. Prior to camp, I met with Kelly to plan a PBL unit. The unit invited scholars (the name used to refer to campers) to create a playlist of three songs that identified themes in one of or a combination of three texts: *Concrete Rose* (Thomas, 2021) or *The Hate U Give* (Thomas, 2017) or *The Rose that Grew from Concrete* (Shakur, 1999). The driving question of the unit was: How can we use music to explain the lived experience of Black people in America?

As one of the goals of the camp was to help scholars explore a career in education. On day one, instructors and I led them through the gold standard elements of high quality PBL prior to their participation in a PBL unit (Boss & Larmer, 2018). We asked scholars to create physical representations of the seven essential design elements of PBL. I saw the concepts “click” for students as they created physical representations. They began to understand how the process would unfold, and my anxiety reduced.

On day two, I helped introduce the actual project. We asked scholars to create a slideshow with their playlist to be presented on the last day of camp (see Figure 1 for example of student slides). As I circulated the room and interacted with students, I was surprised by how willing scholars were to engage in this project, despite knowing they were not receiving any kind of reward, namely a grade, for completing it. Scholars were engaged in the project because they wanted to be, not because they had to be.



Figure 1. Sample of Student Slides from the PBL Project

After the final presentations on the last day of camp, scholars evaluated the impact of each gold standard element and made recommendations for how the unit could be improved. Scholars felt the unit included many of the components (challenging question, provided choice and voice, critique and revision) but noted that the project did not factor in an authentic audience for their presentation. Both Kelly and I agreed that this was an important recommendation. After camp, I felt more confident with PBL as I headed into the student teaching semester.

During the student teaching semester, I helped my mentor teacher revamp the junior English curriculum, including redesigning a PBL unit around the novel *The Things They Carried* by Tim O'Brien (2010) (see Table 1 for project overview). The unit focused on mental health. The driving question for the unit was: What effects do mental health issues have on people and communities? Students examined the way post-traumatic stress disorder affected the characters in *The Things They Carried*, and they completed research with peers on mental health topics of their choice. Then, groups were asked to create a script and video for a public service

announcement (PSA) about their mental health topic. I felt prepared to help out in designing this PBL unit since I had previously had the opportunity to apply the knowledge in a low-stakes setting with real students at ExCEL camp.

As I prepared to take over the teaching in a classroom at the same school, my cooperating teacher became my planning partner, and we worked together to design a second PBL project based on the question: How do we prevent the United States from becoming a dystopia? Although I was on my own, I felt set up to succeed in the implementation of PBL. After having spent time working on it in an undergraduate course, implementing PBL in a low-stakes setting, and getting to practice PBL with the guidance of a veteran teacher, I felt prepared for the creation and implementation of a new PBL unit. Multiple opportunities to learn about and implement PBL before graduating provided scaffolded opportunities for experience and practice implementing PBL. With each opportunity to practice came increased growth and confidence in my ability to help students construct their own learning during a PBL unit.

Table 1

Project Planner			
1. Project Overview			
Project Title	Post Traumatic Stress Disorder PBL Unit	Novel or Book(s)	<i>The Things They Carried</i> by Tim O'Brien
Driving Question	What effects do mental health issues have on people and communities?	Public Product(s)	Script and video of a public service announcement. The public service announcements will be indexed by topic and available through the school's website.
Grade level/Subject	Grade 11/English III		
Time Frame	Two Weeks		
Project Summary	Students will work in teams to research mental health issues and their impact on individuals and communities. They will write a script and film a one-minute-long public service announcement on a mental health topic of their choosing.		
2. Learning Goals			
Standards	SL.11-12.4 (presentation) SL.11-12.5 (use of digital media) SL.11-12.1 (collaborative discussion) W.11-12.2.a-d (informational writing) RI.11-12.1 (Selection of supporting evidence) RI.11-12.6 (rhetoric in relation to purpose) WS.11-12.7 (synthesis for understanding of topic) WS.11-12.8 (citation)	Literacy Skills	Reading for information Informational Writing Collaborative Conversation Use of media tools for presentation Citation of Sources
Key Vocabulary	ethos, pathos, logos	Success Skills	Use of appeals, Critical thinking, collaboration, self-management

3. Project Milestones					
Milestone #1	Milestone #2	Milestone #3	Milestone #4	Milestone #5	Milestone #6 Public Product
Student will select their groups and build their appeals pyramid to review the concepts.	Students will deconstruct a model PSA. How did writers use rhetorical appeals?	Students will research mental health issues and select topics.	Students will compile a research and construct an outline for the script.	Students will produce a written copy of the script to be reviewed by mental health specialists from the community.	Students will film PSAs using Flipgrid or Screen Castify.
Key Student Question	Key Student Question	Key Student Question	Key Student Question	Key Student Question	Key Student Question
What are the rhetorical appeals?	How did the writer and the director use rhetorical appeals to create an effective PSA?	What mental health issue interests or affects you?	What sources and appeals will you use to create a PSA?	How can you improve your script for a more effective PSA?	Was your PSA effective? Why or Why not?
Formative Assessment(s)	Formative Assessment(s)	Formative Assessment(s)	Formative Assessment(s)	Formative Assessment(s)	Summative Assessment(s)
Google Sheet tracking progress for groups	Template with feedback from the teacher	Brainstormed list of issues	Presentation on appeals	Scripts with feedback from the specialists	PSA

*Adapted from template on PBLWorks.org

Conclusion

It is no secret to anyone who has spent time working with K-12 students that they are more likely to do something when they care about what they are doing. The first step in creating a successful PBL unit is aligning content with an authentic question that students care about. To what extent is the American Dream achievable? Under what circumstances is it right to rebel? Does free will really exist? How does social media

affect our brains? Allowing students to use inquiry to address an issue they care about may significantly contribute to meaningful learning (Boss & Larmer, 2018). Preparing preservice teachers to teach in this way, with experiences learning as a PBL student and scaffolded teaching opportunities, teacher educators can provide the in-depth practice preservice teachers need to increase confidence with PBL teaching.

Even if a teacher preparation program does not include PBL, it's not too late. In-service teachers can begin implementing PBL by participating in professional development opportunities, by reading books and articles, or by reaching out to PBL educators via social media. There are great trainings offered at many Intermediate School Districts and local museums/institutes. To help teachers with PBL, we also offer the following advice:

Tips for Educators Interested in PBL

For educators new to PBL, tips from a novice:

1. Lean into the expertise that exists around you in professors, mentor teachers, and other veteran teacher colleagues.
2. When designing a project, identify authentic audiences in your community.
3. Build relationships with your students in order to design questions and PBL units that are relevant to them.
4. Ask for help.
5. Start small and build your PBL units over the years.
6. Incorporate content or collaborate with colleagues from other content areas.
7. Set up a free account and explore at PBLWorks.org.
8. Participate in a free PBL course with the Van Andel Institute <https://www.vai.org/k-12-education/for-educators/>

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Kelly Margot is an assistant professor at Grand Valley State University in Grand Rapids, Michigan. She received her PhD in Educational Psychology with a concentration in Gifted Education from the University of North Texas. In her role at GVSU, Kelly has worked to spread the word about the power of Project Based Learning's ability to reach all learners. Kelly is a gifted advocate for proper identification, appropriate curricula, ongoing research, and educating practitioners and parents. Her book *Gifted Education and Gifted Students* was released in January 2020. She can be reached at <margotk@gvsu.edu>.

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