

PROJECT-BASED LEARNING: ENACTING PBL WITHOUT FEAR

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Abstract

Teachers considering the enactment of project-based learning in their classrooms face two challenges, time management, and classroom discipline. By identifying strategies and tools to use in the enactment of project-based learning, teachers can build confidence in their abilities to manage classrooms using contracts, task completion guides, and project workday assessments. The strategies and tools were modeled in an introduction to education course for preservice teachers. Exposure to methods and strategies resulted in a more informed class that is better prepared to enact project-based learning effectively in their future classroom.

Keywords: Project-based learning, time management, classroom management

Over the past decade, extensive research has been conducted that demonstrated project-based learning can be an effective strategy for enhancing student engagement and student achievement (Brush, et al., 2013). According to Grahame (2011), project-based learning is “a systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and tasks” (p. 95) Thomas (2000), states project-based learning is an innovative methodology used to provide instruction for students in an authentic work-related setting.

In addition to academic gains, the instructional method has been associated with improving attendance rates (Creghan & Adair-Creghan, 2015; Zusevics, Lemke, Harley, & Florsheim, 2013). According to Creghan and Adair-Creghan (2015), the attendance of economically disadvantaged students using project-based learning resulted in academic gains that were “statistically significant over a period of three years.” It is not surprising that as administrators have become more aware of this research it has led more K-12 schools to adopt project-based learning (PBL) as an overarching model for their curriculum (Brush & Saye, 2017). If the benefits of PBL have been noted for an extensive period of time and the use of the method has expanded into most schools; it is important to consider why teachers have refused its incorporation. One reason, perhaps, is that teachers find the preparation of such projects overwhelming and the multiple ways students may showcase knowledge may result in teacher perception they have lost classroom control (Barton & Levstik, 2015). Teachers fear collaborative groups will become loud and move around the classroom again giving the perception to administrators that the class is unorganized and out of the control.

Some teachers are fearful that the incorporation of such projects will limit the ability to cover the material that is essential for the students to master (Larmer, 2018). According to Baghoussi and El Ouchdi (2019), the two major obstacles teachers faced in applying project-based learning in their classrooms was controlling/managing the class and a shortage of time. Coverage of material is the cardinal educational goal of most teachers in this era of high stakes testing. This mentality often overvalues the teacher's lecture and leaves little room for alternative methods to be utilized in the classroom (Matheson, 2008). According to Minarechova (2012),

"High-stakes testing interferes with teaching and learning. Under high-stakes testing, the way students are taught is changing along with the methods used and the way in which teachers approach instruction. Creative interdisciplinary activities and project-based investigations are being left out" (p. 91).

Preparing Preservice Teachers

Professors, currently, have limited impact on federal legislation that dictates educational policy. Their control lies in effective modeling of methodologies to effectively preservice teachers. This study examined two major elements that prevented teachers from enacting project-based learning, managing their students and using class time efficiently. For the purposes of this study, those skills were taught by using the project-based learning method. Prior research suggested that providing preservice teachers the opportunity to participate in a PBL activity suggested an increased likelihood that they would incorporate the method in their own classrooms (Park & Ertmer, 2008; So & Kim, 2009). Therefore, undergraduate students participating in this study were tasked with the development of a cross-curricular project-based learning task.

The secondary education students at our institution major in their field of study and minor in education. This results in college classrooms filled with students of diverse content area expertise, and therefore, provided an ideal opportunity for collaboration and the promotion of cross-curricular pedagogy. The significance of cross-curricular teaching according to Resnick (1989),

is increased student motivation and engagement because when students experience an interdisciplinary approach, the value of what they are learning becomes clearer as they can apply their acquired competences to many subjects as well as to how they react to and operate in the real world (p. 33).

Strutchens and Martin (2017) claimed preservice teachers should be provided with an opportunity to look across grades to determine how the curriculum grows and how topics are interconnected and scaffolded. This experience encouraged preservice teachers to look across secondary grades and through multiple content area lenses to enhance their understanding of what a high school student was required to learn. The researchers felt it was essential to provide preservice teachers an opportunity to work collaboratively to develop a cross-curricular project-based learning task in a safe environment where they could be introduced to tools, watch actions of experienced teachers, and ask questions throughout the process.

Dr. Swift's Class

The project was introduced to students via a one-minute video clip created at a charter school within the same state as our institution. The video clip included commentary from stakeholders of the school that communicated positive experiences students had participating in cross-curricular project-based learning tasks. Preservice teachers were asked to envision themselves working at a school where the principal required them to develop a cross-curricular project-based learning task that covered the standards taught that school year.

For the purposes of this study, preservice teacher participants were required to develop an authentic, real-world, project-based inquiry task that incorporated at least one standard from three different content areas. Multiple intelligence domains were utilized to ensure students had choice of investigation methodology. In addition, participants were given choice as to which state standards would be addressed within their project. The structure of the learning task included opportunities to (1) reflect on process, (2) receive critiques from peers, and (3) make a public presentation. The project rubric inclusive of the above criteria was explained to all participants and included all seven-essential project-based learning elements deemed critical by Larmer and Mergendoller (2010).

Identifying Pedagogy

Following the project introduction, several items were brought to the attention of the class. Group work was defined as an essential expectation with the rationale being that students frequently become familiar with content through the expertise of their peers. For problem-based learning to be successful, an environment of trust and respect must be in place. Students must feel free to risk without thought of reprisal. According to Solomon (2007), creating a classroom environment where students feel empowered because they can see themselves as capable of participating in and being doers of education is important.

As the class transitioned from discussion to group work, preservice teacher study participants started constructing a project-based learning task under the researcher's supervision. This provided an opportunity to model the actions of a teacher and provide tools that could be used in their classrooms. Kujansivu and Rosell (2000) suggested teachers be involved in the following activities when enacting PBL: (1) observe students, (2) listen to group discussions from a proper distance, (3) ask questions to groups who become stuck, (4) provide positive feedback to individuals and groups, (5) watch not only for students who readily participate and those who do not; but also investigate potential reasons for this, and (6) remind the groups about rules, roles, and norms.

In project-based learning, the role of the teacher changes from director to facilitator (Hmelo-Silver, 2004). As the preservice teachers worked to complete the team contract, the researcher visited each table asking what content areas are in each group. The work progress was monitored to (1) determine if all the group members participated, and (2) to determine those individuals that seemed to withdraw or who were occupying themselves with portable technology. If a student was disengaged, the researcher moved to the group and directed several questions to that individual focused on items from the team contract. In addition, off task students were asked about the problem they had identified and how it aligned with the targeted standards. The instructional goal was to push, encourage, and guide the students down their path of investigation, while still ensuring on task behavior was the norm.

Tools

To ensure the success of Project based learning, students were provided with a few tools. The first tool was a team contract (Swift, 2019). See Appendix A. The team contract gave students in each group a working document on which to note: (1) how decisions would be made, (2) when the group would meet, (3) how they would share information, (4) how they would ensure quality work, (5) which task each member would be responsible for, and (6) each member's contact information. The contract served as a visible representation that each member of the group was essential and was required to participate. To complete the document, each group member was required to provide input and sign the document, stating that they would uphold their responsibilities. The team contract helped manage behavior by including each group member in the process of making decisions. The contract helped facilitate communication, thus providing an opportunity for each person to check the status of their partners.

On the project introduction day, students were eager to get started and conduct research. Capitalizing on student excitement and interest in a topic helps a teacher manage the classroom. To harness that excitement and apply that energy to investigating topics is more easily managed when students understand clearly all expectations. It is important that teachers utilizing PBL projects provide students with a specific plan during an in-class workday. To model this, the preservice teachers were given an individual project work analysis document (Swift, 2019). See Appendix B. The document guided students through the research process by providing a template for the organization of their findings explained through highly focused and clearly stated steps. The individual project work analysis document enabled students to state the topic they researched, report findings, describe obstacles they faced, explain solutions they developed, and summarize their progress. Requiring preservice teachers to complete the individual work analysis document gave them insight into how a student should be using their time during the project workday when given a specific task aligned with a measurable and obtainable objective.

Modeling

As preservice teachers investigated state standards that could be combined to craft an engaging real-world problem for students to overcome, the researcher worked alongside and demonstrated evidenced-based strategies known to help students achieve success. Both Hmelo-Silver (2004) and Swift (2018) asserted the importance of teacher mentorship and guidance in seeking content-based solutions to authentic scenarios. Therefore, the researcher in this project emphasized conversed with participating students at all stages of project development in an effort to ensure that (1) questions were answered in a timely fashion, (2) resources were available and (3) effective instructional strategies were conveyed clearly. Such conversations, however, often produced more student questions as they dove deeper into their chosen topic; thus, enabling the researcher to give additional resources and guidance. Saye and Brush (2002) refer to this process as providing soft scaffolds or the ability to "continuously diagnose the understandings of learners and provide timely support based on student responses" (p. 82) Lottero-Perdue (2017) communicated the importance of teaching soft scaffolds for interns learning to teach PBL.

As the project workday concluded, student discussions were held focused on their thoughts about utilization of all phases of PBL including graphic organizers, conversations with ensuing questions between professor and students, and the use of proximity to manage behaviors. By debriefing such actions that occurred throughout the class period, student attention was purposefully drawn to those behaviors giving the researcher opportunities to explain the significance of each scaffolded action.

Danielson (2008) claims reflection is an essential teaching practice. By including the preservice teachers in this task, it became an opportunity for growth. As the preservice teachers left class, they were required to turn in their individual project work analysis documents as part of their grade in the course.

Feedback

During the next class, the students received their individual project work analysis documents with feedback. The feedback addressed incomplete work, suggestions for further research, and positive comments. The preservice teachers were encouraged to stay after class for any additional questions they had or to discuss their ideas in more detail. Providing the students with feedback allowed the teacher to support student inquiry and shape the direction the students were taking by suggesting topics to review or questions to address. This task played a vital role in the enactment of project-based learning by providing feedback and revision opportunities. Despite the importance of the step, it consumed very little class time, providing an opportunity for the teacher to scaffold learning by introducing new information through a different method.

Communication

One week after introducing the project to the preservice teachers, the instructor related the bell work activity in class to the project by asking the preservice teachers to complete the project obligation evaluation document (Swift, 2019). See Appendix C. The preservice teachers used the time to meet with their group, report on progress of individually assigned tasks, and present their group with evidence of their work's progress. Each group member had an opportunity to verify (hold accountable) the progress of their team members by signing the project evaluation document. As each group finished discussing their progress, the professor reviewed each document, checking to see how each group member was evaluated by their peers. The purpose of the tool was the subject of a debriefing session with students where insurance of document validity was discussed. Appropriate strategies to address unfavorable peer evaluations were discussed as well. Finally, the value of the graphic organizer and how it could be a useful tool in managing the classroom and maximizing time was addressed.

Presentation

The preservice teachers were eager to present their cross-curricular project-based lesson plans with their peers. Each group had an opportunity to share their work with the class. As the preservice teachers listened to the presentations, they were required to complete a critical friend's protocol. I discussed the importance of keeping the class engaged during the presentation and holding them accountable for the new knowledge that was discussed. Each member of the class was asked to keep track of one specific element they appreciated about each of the projects and to keep a record of either one question that surfaced from each presentation or a suggestion of further steps that might be taken to enhance the project. By giving students specific tasks to complete during each PBL presentation, they remained engaged throughout the learning activity. The task also provided rich commentary and feedback for each group, allowing them to hear the strengths of their project as well as areas that could be improved upon.

Findings

The researchers believe the enactment of a project-based learning task for preservice teachers was and continues to be a vital component in equipping them with the skills to be effective educators. Recent definitions of the requirements for high-quality teaching emphasized not only content and pedagogical knowledge but also the use of innovative instructional strategies to support students' acquisition of complex problem solving (Bell, 2010; U.S. Department of Education, 2010). Through the PBL experience in a foundational education course, students developed a project-based learning task that they can enact in their classrooms. More importantly, researched-based fears of enacting project-based learning were addressed in an authentic context.

Classroom Management

The preservice teachers were introduced to the instructional strategies teachers use when enacting project-based learning tasks. Baker (2005) stated that teachers require a wide variety of classroom management procedures to develop an effective learning environment for students. Some of the methods the preservice teachers observed included the use of proximity, redirection through questioning, and holding students accountable by requiring the completion of specific tasks.

Time Management

Providing methods to help the preservice teachers alleviate their fears of managing the classroom allowed us to focus on utilizing time effectively. The preservice teachers used several graphic organizers that held students accountable to complete specific tasks. Graphic organizers can support self-monitoring strategies that encourage students to review their work and assist with planning (Harris, Graham, Mason, & Friedlander, 2008). Dexter and Hughes (2011) suggest, teachers use graphic organizers to support students with planning and organization. The graphic organizers the preservice teachers used were constructed in a way that allowed for quick analysis, which allowed the professor to determine the students' progress in a few minutes. The preservice teachers discussed the function of the graphic organizers and the need to frequently check student progress without devoting large amounts of time to the task. The preservice teachers experienced the questioning of decisions and findings to encourage deeper analysis and continued research. This strategy helped keep the class engaged and proved to be useful in redirecting students who were off task.

Conclusion

By helping preservice teachers address the two major challenges and identify ways to overcome those challenges the preservice teachers became more confident in the development and enactment of project-based learning. The project-based learning task that was incorporated in the introductory education class provided the preservice teachers with skills, tools, and a deeper understanding to successfully enact project-based learning in their classrooms.

References

- Adams, C., Lo, J., Goodell, A., & Nachtigala, S. (2017). Shifting pedagogy in an AP US government & politics classroom: A DBIR exploration of teacher growth. *Teaching and Teacher Education, 64*, 79-92.
- Baghoussi, M., & El Ouchdi, I. Z. (2019). The implementation of the project-based learning approach in the Algerian EFL context: Curriculum designers' expectations and teachers' obstacles. *Arab World English Journal, 10*(1), 271-282.
- Baker, P. H. (2005). Managing student behavior: How ready are teachers to meet the challenge? *American Secondary Education, 33*(3), 51-64.
- Barton, K., & Levstik, L. (2015). Why don't more history teachers engage students in interpretation? In W. Parker, *Social studies today: Research and practice* (pp. 36-40). New York, NY: Routledge Taylor & Francis Group.
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Cleaning House: A Journal of Educational Strategies, Issues, and Ideas, 83*(2), 39-42.
- Brush, T., & Saye, J. (2017). Problem-based learning in K-12 and teacher education: Introduction and current trends. In T. Brush, & J. W. Saye (Eds.), *Successfully implementing problem-based learning in classrooms: Research in K-12 and teacher education* (pp. 3-42). West Lafayette, IN: Purdue University Press.
- Brush, T., Glazewski, K., Ottenbreit-Leftwich, A., Saye, J., Zhang, Z., & Shin, S. (2013). Teh PBL-TECH project: Web-based tools and resources to support problem-based learning in pre-service teacher education. In L. Liu, D. Gibson, & C. Maddux (Eds.), *Research highlights in technology and teacher education 2013*. Chesapeake, VA: AACE.
- Creghan, C., & Adair-Creghan, K. (2015). The positive impact of project-based learning on attendance of an economically disadvantaged student population: A multiyear study. *Interdisciplinary Journal of Problem-Based Learning, 9*(2).
- Danielson, C. (2008). *Enhancing professional practice: A framework for teaching* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.
- Dewey, J. (1938). *Experience & education*. New York, NY: Touchstone.
- Dexter, D. D., & Hughes, C. A. (2011). Graphic organizers and students with learning disabilities: A meta-analysis. *Learning Disability Quarterly, 34*(1), 51-72.
- Goe, L., Wylie, C., Bosso, D., & Olson, D. (2017). *State of the states' teacher evaluation and support systems: A perspective from exemplary teachers*. Princeton, NJ: ETS Research Reports Series.
- Grahame, S. D. (2011). *Science education in a rapidly changing world*. Hauppauge, NY: Nova Science Publishers.
- Harris, K. R., Graham, S., Mason, L. H., & Friedlander, B. (2008). *Powerful writing strategies for all students*. Baltimore, MD: Brookes.
- Hmelo-Silver, C. (2004). Problem based learning: What and how do students learn. *Educational Psychology Review, 16*(3), 235-265.
- Homrich-Knieling, M. (2019). From rapport to relationships: Shifting our practice from classroom management to community. *Voices from the Middle, 24*(1), 58-61.
- Kujansivu, A., & Rosell, J. A. (2000). Complex instruction as a tool for developing the role of the teacher. *A workshop presented at the Intercultural Education and Co-operative Learning conference, 11*, pp. S21-S26. Ghent: Intercultural Education.
- Larmer, J., & Mergendoller, J. (2010). Giving students meaningful work. *Educational Leadership, 68*(1), 34-37.
- Lottero-Perdue, P. S. (2017). Preservice elementary teachers learning to teach PBL through science-integrated engineering design. In T. Brush, & J. W. Saye (Eds.), *Successfully implementing problem-based learning in classrooms* (pp. 105-131). West Lafayette, IN: Purdue University Press.
- Matheson, C. (2008). The educational value and effectiveness of lectures. *The Clinical Teacher, 5*(2), 218-221.
- Minarechova, M. (2012). Negative impacts of high-stakes testing. *Journal of Pedagogy, 3*(1), 82-100.
- Park, S. H., & Ertmer, P. A. (2008). Impact of problem-based learning (PBL) on teachers' beliefs regarding technology use. *Journal of Research on Technology in Education, 40*(2), 247-267.
- Parker, W., & Lo, J. (2015). Reinventing the high school government course: Rigor, simulations, and learning from text. *Democracy & Education, 1-10*.

- Parker, W., & Lo, J. (2016). "Give us your best advice": Assessing deep political learning. *Social Education*, 227-231.
- Resnick, L. B., & Klopfer, L. E. (Eds.). (1989). *Toward the thinking curriculum: Current cognitive research*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Saye, J. W., & Brush, T. (2002). Scaffolding critical reasoning about history and social issues in multimedia-supported learning environments. *Educational Technology Research and Development*, 50(3), 77-96.
- So, H., & Kim, B. (2009). Learning about problem based learning: Student teachers integrating technology, pedagogy and content knowledge. *Australasian Journal of Educational Technology*, 25(1), 101-116.
- Solomon, Y. (2007). Not belonging? What makes a functional learner identity in undergraduate mathematics? *Studies in Higher Education*, 32(1), 79-96.
- Strutchens, M. E., & Martin, W. G. (2017). Transforming preservice secondary mathematics teachers' practices: Promoting problem solving and sense making. In T. Brush, & J. W. Saye (Eds.), *Successfully implementing problem-based learning in classrooms: Research in K-12 and teacher education* (pp. 3-42). West Lafayette, IN: Purdue University Press.
- Swift, A. (2018). Integration of project-based learning in elementary social studies. *The Councilor: A Journal of the Social Studies*, 79(2), Article 4.
- Swift, A. (2019). *Enacting project-based learning in AP United States history*. Auburn Hills, MI: Teacher's Discovery.
- Thomas, J. (2000). *A review of research on project-based learning*. San Rafael, CA: Autodesk Foundation.
- U.S. Department of Education. (2010). *Transforming American education: Learning powered by technology*. Retrieved from <http://www.ed.gov/sites/default/files/netp2010-execsomm.pdf>
- Zusevics, K. L., Lemke, M. A., Harley, A. E., & Florsheim, P. (2013). Project health: Evaluation of a project-based health education program. *Health Education*, 113(3), 232-253.

Appendix A
Team Contract

Project Name:	Class Period:
How will decisions be made?	
When will the group meet?	
How will the group share information?	
How will you ensure quality work?	

Name:	Email or Cell #:
Task(s):	
Task(s) completion date:	
_____	_____
Signature	Date

Name:	Email or Cell #:
Task(s):	
Task(s) completion date:	
_____	_____
Signature	Date

Name:	Email or Cell #:
Task(s):	
Task(s) completion date:	
_____	_____
Signature	Date

Name:	Email or Cell #:
Task(s):	
Task(s) completion date:	
_____	_____
Signature	Date

Appendix B
Individual Project Work Analysis Document

Name:		Project Title:	
Date:		Class Period:	
State Standard Related to Todays Work:			
Research Objective:			
Topic:	Action Step:	Data Source:	
Findings:			
Research Objective:			
Topic:	Action Step:	Data Source:	
Findings:			
Project Development Task:			
Action Step:		Results:	
Anticipated Obstacle:		Solution:	
Progress Made:			
Resources Needed:			

Appendix C
Project Obligation Evaluation

Project Name:	Class Period:
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Group Member:		
Task(s):		
Due Date:		
Status:		
Task approval of group member 1 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 2 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 3 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial

Teacher approval _____

Group Member:		
Task(s):		
Due Date:		
Status:		
Task approval of group member 1 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 2 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 3 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial

Teacher approval _____

Group Member:		
Task:		
Due Date(s):		
Status:		
Task approval of group member 1 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 2 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 3 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial

Teacher approval _____

Group Member:		
Task(s):		
Due Date:		
Status:		
Task approval of group member 1 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 2 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial	Task approval of group member 3 <input type="checkbox"/> <input type="checkbox"/> _____ No Yes initial

Teacher approval _____