LITERATURE REVIEW
PROJECT-BASED LEARNING

Project-based Learning, commonly known as PBL, is a way to teach that uses student-directed projects as a vehicle for meeting academic standards. Historically projects have been used to demonstrate that students have gained content knowledge. For example, students would build a model of a historic battleground after learning about that battle in a social studies class. PBL is an instructional approach where students learn by investigating a complex question, problem, or challenge and develop a solution to that problem. The project culminates in student-led action to tackle that identified issue.

Post-action, students then reflect on the entire PBL experience. This reflection has been found to be central to the learning process, and gives students the opportunity to lay the foundation for their work in the future (English and Kitsantas 2013). For learners to be motivated to take action, they need to master the skills of inquiry, analysis, and exploration, and curiosity (Jeffery 2010). While PBL is a method of content instruction, it also works on the mastery of these critical thinking skills.

This review summarizes the benefits of project-based approaches to classroom instruction. The educational research community overwhelmingly supports the conclusion that PBL generates a wealth of learning gains for students. It creates problem-solvers, helps students achieve higher levels of academic success, increases engagement in the classroom, creates environmental stewards, among other great benefits. These are discussed below.

This type of teaching has been found to be most effective when integrated directly into curriculum (Bridgeland et al. 2008) as opposed to thinking of it as an add-on. When done effectively, PBL is youth-driven, meaning students have a say in the direction of their learning (Bridgeland 2008; Levinson 2014). Giving youth the power to make decisions changes how students understand the world (Levinson 2014). Levinson argues that PBL helps reshape students' ability to think about social and political possibilities.

A body of research extending back almost three decades shows a multitude of gains for students participating in PBL classes as compared to traditional teaching. Morgan and Streb (2001) found that the empowerment created by giving students a voice in their own learning improved their sense of self-efficacy and belief in their own competence. In particular, they found that when students had responsibility over real tasks, made decisions, and planned their action, it had substantial positive impacts on self-concept and improved attitudes towards people dissimilar from themselves.

Similarly, a study by Bitter and Loney (2015) found that students who went through programs like PBL achieved higher academically, had stronger inter- and intrapersonal skills, had higher on-time graduation rates, and a higher rate of enrollment in four year colleges compared to their peers. Students find these programs more interesting, and says it helps motivate them to work hard (Bridgeland et al. 2008). These results are echoed in Furco (1996) where students developed more positive attitudes towards school, themselves, others, and their community. Melchior (1998) found improvement in school engagement and math grades specifically when participating in these programs. In this study, an overwhelming number of

participants said they learned a new useful skill, and said they learned more than they would have in a “typical class”. Billig et al. (2005) found that participants in these projects scored higher on multiple outcomes, as well as enjoyed school more compared to their peers. It has also been noted that having gone through these project-based experiences can help students stay in school should major life events occur (Bridgeland et al. 2008). A plethora of other studies have been conducted that also show similar academic gains (Billing et al. 2012; Coyle 2005; Harris et al. 2014; Lieberman and Hoody 1998; NELS 1998; Zint et al. 2014). There have also been findings of educational and motivational gains for educators as well (Billing et al. 2012). The jury is out- PBL helps students, and educators, learn and grow.

In addition to the more immediate learning benefits of PBL, PBL combined with environmental content has been shown to increase long-term stewardship behavior. This body of work began with Hungerford and Volk (1990) when they made the case that traditional, more instructional approaches to environmental education were not creating stewards. Instead, they insisted that students need to have a deep understanding of the issues at hand, the tools to analyze data, and the ability to learn citizenship skills. Hungerford and Volk’s argument lead to a variety of studies testing this idea, which has become substantially supported. In 2012, Chawla and Derr did a meta analysis on this concept. They looked at a variety of education delivery methods and found that this project/community-based approach was the most successful in creating behavior changes in students. It has also been found, time and again, that not just promoting environmental knowledge, but problem solving *skills* are needed in order to promote environmental behavior change (Cheng and Monroe 2012; Zint et al. 2014).

PBL in a school based setting provides a wonderful opportunity to help students prosper, both in the short- and long-term, academically and behaviorally. The literature shows that students often do better academically, socially, have increased motivation and engagement in school, build critical thinking skills, and stewardship behaviors. They will engage more in their community, and learn first-hand how to problem solve. When done effectively, students will own their voices, have a say in their own learning and increase their self-efficacy. All of these, and more, are attainable with project-based approaches integrated into classroom curriculum.

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