Project-based Learning as an Alternative to the Pedagogy of Poverty in Low-income Schools

Shannon N. Giesige

Abstract: The pedagogy of poverty is a phrase coined by Haberman in 1991 to describe the didactic teacher-centered learning that takes place in most urban, low-income schools. This form of teaching is based on assumptions that teachers, administrators, and parents make about the students they are teaching and the students' goals, aims and capabilities. This manuscript discusses why teachers turn to the pedagogy of poverty and how project-based learning offers a workable alternative in a low-income, urban environment. It examines how project-based learning can improve student self-efficacy and academic performance, as well as exploring what this method asks of teachers.

Introduction

I stood nervously in front of my seventh grade classroom about to teach for the very first time. I had spent hours carefully gluing pictures on little cardboard boxes preparing an activity called "The Incredible Journey" (Project Wet). I would ask my students to role-play as rain drops working their way through the water cycle. They would role the cardboard dice and it would tell them which station to go to. Afterward, I would ask them about their journeys. Where did you go? When were you a liquid? Did you get stuck anywhere? Why? As my students walked into the classroom, I worried about so many things. Would they be able to do the activity? Would they fight with each other? Would they care?

What does learning look like? When you think of a k-12 science classroom, what do you see? Are students sitting quietly at their desks reading, taking notes, listening to the teacher lecture? Are the students bored? If your imagination is vivid, perhaps there is one student in the back with their head down, taking a nap. Maybe you've seen this image of school on television or maybe this was your own school experience, but is this image the best way that students learn? Is this the best way that you learn?

Imagine a different sort of classroom. One where students are working together to create something or to solve a problem. Perhaps it is loud. Maybe the students are debating in small groups, intent on accomplishing their work. Papers are scattered everywhere. Where is the teacher in this classroom? She is not standing in the front of the room, lecturing. Instead, she is moving from group to group, asking questions rather than answering them, prodding the students to make new discoveries. Is anyone sleeping in this classroom? Does it look like learning is taking place? If you walked into this classroom with idea of the quiet, teacher-centered environment that was first described, what would you think?

As I explained the rules of the "Incredible Journey" activity to my students on that first day, they seemed interested. They stood up and went to their first stations. They rolled the dice and recorded where they went as raindrops. When

it was over and I began asking them questions, they were excited to tell me where they had been. They shared the frustrations of getting stuck in a glacier and when I asked them when they were a liquid, a solid, or a gas, they were thoughtful. They asked questions and were engaged. They said that they liked getting up and walking around. They wanted to do more activities like that.

As we enter into our own classrooms, we must make a choice about what learning looks like. Will our students be asked to sit quietly in rows, taking notes and listening to us lecture? Or will we challenge our students to figure things out on their own, to interact with the world on their own terms? Will we ask our students to be repositories for the knowledge we teachers choose to bestow on them or will we challenge them to construct their own meanings and explore in ways we can't always predict?

The Pedagogy of Poverty

In 1991, Haberman coined the term "pedagogy of poverty" to describe the didactic, teacher-centered form of teaching that is often found in low-income urban schools. This format of teaching runs counter to modern teaching practices, which place more emphasis on student-centered, inquiry based learning.

Four assumptions describe the Pedagogy of Poverty:

> (1) Teaching is what teachers do, learning is what students do. Therefore, students and teachers are engaged in different activities...
>
> (2) Teachers are in charge and responsible. Students are those who still need to develop appropriate behavior…
>
> (3) Students represent a wide range of individual differences… therefore ranking of some sort is inevitable.
>
> (4) Basic skills are a prerequisite for learning and living and students are not necessarily interested in these basic skills. Therefore, directive pedagogy must be used (Haberman, 1991, p. 83)

According to Haberman this pedagogy, while outmoded, appeals to many groups of people. It appeals to parents who did not do well in school themselves and believe they could have done better if only someone had forced them to learn. It appeals to those who rely on "common sense" and view freer teaching as "permissiveness" or weakness. It appeals to those who fear minorities and the poor and feel a need to exercise control. It appeals to those who have low expectations for these students. Finally, it appeals to those who do not know the full range of pedagogical options available.

Why was I so worried about my students' behavior as I stood in front of my seventh grade class? Why did I think that they wouldn't care about the lesson? I had been placed at a Title I school. All my students qualified for free or reduced lunches. I had seen my students struggle with meeting classroom expectations for behavior. As I continued in my placement, I would be told time and time again that I needed to get a handle on my classroom management. My mentor teacher never once commented on my lesson plans or their adherence to the curriculum. The teachers, the

administrators, and the parents of the students had all bought in to the four assumptions. When I observed my classroom, my mentor teacher stood in the front and gave the students vocabulary to record or chapters to read. The focus of the classroom was on displaying classroom-appropriate behavior first, learning second and the expectations for these learners and their abilities were low.

Project-Based Learning

Compare this kind of environment to one using project-based learning. Project-based learning (PBL) is a method based on constructivism and the ways in which students make meaning. As Lou and colleages (2011) described, it is an approach that gives students the opportunity to design, solve problems, and make decisions based on a challenging question. It gives students opportunities to independently accomplish related tasks and present their results. PBL is learner-centered, encourages teamwork and cooperative learning, allows student to continuously improve their work or outcomes, involves students actively discovering instead of learning related knowledge, includes students producing work, reports, or results and is challenging and depends upon high-level skills. From the teacher's perspective, PBL focuses on authentic content, purposes, and evaluations, and has specific educational goals. Teachers are defined as helpers rather than direct instructors, and it also allows teachers to be learners.

Self-Efficacy

Imagine being that student sitting in the teacher-centered class. After six hours of notes and lectures, what are you thinking? Are you excited about anything that you have learned? Do you think you'll remember any of the lessons in a year? In a month? Tomorrow? Has being in this classroom affected your outlook on yourself, on your community, or on your science abilities?

Now imagine that you are one of the students in a study conducted by Hiller and Kitsantas (2014). Students in this study spent a day conducting fieldwork on horseshoe crabs. These students went to the beach and were taught by experts how to collect data by taking measurements on horseshoe crabs. Hiller and Kitsantas analyzed data from pre- and post-tests on and found that the treatment group outperformed the comparison group in not only academic achievement, but measures of self-efficacy, science observation skills, task interest, and career interest in science. This example of PBL allowed students to see themselves as scientists and gain confidence in their own scientific abilities.

In contrast, the pedagogy of poverty focuses on encouraging students to behave appropriately rather than encouraging them to think scientifically. Varelas, Kane, and Wylie (2011) performed a study on how low-income African American first, second, and third grade students construct their identities in the frame of science and scientists. In this study, science teachers worked with researchers to develop instruction that was interactive, participatory and dialogic. Researchers found that the children had developed complex relationships that fused the concepts of "doing science" and "doing school." Many students defined "smartness" and being a "good scientist" in relation to behaving appropriately in class. What our students

know about doing science is only what we can teach them in our classrooms. If we become so focused on student behaviors rather than student abilities, we risk them losing the skills that make truly great scientists, including curiosity, willingness to take intellectual risks, and the ability to collaborate with others to create something new. By labeling students who are loud, energetic, or willing to take risks in their work and their answers as "bad" or "problem" students, we ironically teach them that these are not the skills that a scientist needs. In contrast, PBL encourages these skills. It rewards students who take risks and communicate well with others, 21st century skills that will serve students in any career path they may take.

Academic Performance

Educators want to engage their students, but feel immense pressure to meet academic standards and for your students to succeed on standardized tests. Can these standards be met with project-based learning? Out of five studies that compared project-based learning to didactic teacher-centered learning, three studies showed better results for those using project-based learning and the remaining two showed no statistical difference between the control and treatment groups. No group showed worse academic outcomes for the students engaged in project-based learning (Chen, Hernandez & Dong, 2015; Han, Capraro & Capraro, 2015; Hiller & Kitsantas, 2014; Horak & Galluzzo, 2017; Scogin, Kruger, Jekkals & Steinfeldt, 2017).

What PBL Asks of Teachers

When properly implemented, PBL has been shown to be as effective as or more effective than teacher-centered teaching. However, PBL relies heavily on the pedagogical knowledge and engagement of the instructor. One study by Kanter and Konstantopoulos (2010) specifically studied teachers as they implemented a PBL curriculum for the first time. Nine sixth- through eighth-grade science teachers were given extensive professional development to help them implement the program, meeting for three hours per week for ten weeks. Researchers used essay descriptions that the teachers wrote of their lessons to determine the pedagogical content knowledge of the teachers using a rubric scored from one to seven. They determined that teachers needed to score at least a three on their rubrics to effectively teacher using PBL. This shows that PBL

Teachers must also decide what their goals for their students are. A collective case study by Rogers, Cross, Gresalfi, Trauth-Nare, and Buck (2011) looked at the first-year implementation of PBL by three separate teachers. One of the teachers had a main goal to teach his students 21st century skills. Another teacher wanted to implement PBL to engage students and improve test scores. A third teacher wanted both to teach his students 21st century skills and improve their test scores. The goals of PBL aligned best with the goals of the first teacher in implementing 21st century skills. Thus, he was very happy with his curriculum and completed the entire year using PBL instruction. The second teacher whose focus was largely to improve test scores was uncomfortable with PBL. He felt that without his direct instruction, students would be unable to learn the concepts they needed to do well on the standardized tests they would be taking later that year. As a result, he reverted

to his traditional teaching method about halfway through the school year. The third teacher, who wanted to strike a balance between teaching 21st-century skills and improving test scores, implemented a modified version of PBL that included some teacher-centered instruction intermittent with projects.

Conclusion

In The Widening Gap

Unequal Distribution of Resources for K-12 Science Instruction, Smith, Trygstad and Banilower (2016) used data from the 2012 National Survey of Science and Mathematics Education to discuss how three kinds of resources – well-prepared teachers, material resources, and instruction itself – are allocated to classes that are grouped by prior achievement level. This study found that certain groups are more likely to be viewed as low-achieving than others and that minority students, males, and low-income students were over-represented in these classrooms. They found that students in these low-achieving classrooms were much less likely to have access to hands-on laboratory activities and that teachers used much more didactic teaching practices in these classrooms.

When approaching a low-income school, we owe it to our students to rethink what learning looks like. There will always be pressure to conform to a vision of the classroom that does not match what research shows us is best for our students. There will always be those who find reasons to teach students to sit quietly, to take notes, and to recognize the teacher as the sole authority. It is our job as educators to carefully examine these reasons and then dispose of those that aren't backed up by research. We must do what will truly help our students become better thinkers, learners, and scientists.

Students who take part in project based learning have more positive images of science and their abilities to perform science. They see future careers in science as a possibility that is open for them. We need not worry that they will not learn the information they need to do well on tests without us standing in front of them asking them to copy down notes and definitions, because the research shows that they do just as well, if not better, when they are given the chance to engage in a meaningful way. As we enter our classrooms, we must cast away the four assumptions that lead us into the pedagogy of poverty. We must re-evaluate the reasons we hold for teaching in ways that do not do justice for our students. In doing so, we can create a learning environment that is better for both our students and ourselves.

References

Chen, P., Hernandez, A., & Dong, J. (2015). Impact of collaborative project-based learning on self-efficacy of urban minority students in engineering. Journal of Urban Learning Teaching and Research, 11, 26-39.

Haberman, M. (1991) Pedagogy of poverty versus good teaching. Phi Delta Kappan, 73 (4), 290-294 doi:10.1177/003172171009200223

Han, S. S., Capraro, R., & Capraro, M. (2015). How science, technology, engineering, and mathematics (STEM) project-based learning (PBL) affects high, middle, and low achievers differently: The impact of student factors on

achievement. International Journal of Science & Mathematics Education, 13(5), 1089-1113. doi:10.1007/s10763-014-9526-0

Hiller, S. E., & Kitsantas, A. (2014). The effect of a horseshoe crab citizen science program on middle school student science performance and STEM career motivation. School Science and Mathematics, 114 (6), 302-311. doi:10.1111/ssm.12081

Horak, A. K., & Galluzzo, G. R. (2017). Gifted middle school students' achievement and perceptions of science classroom quality during problem-based learning. Journal of Advanced Academics, 28 (1), 28-50. doi:10.1177/1932202X16683424

Kanter, D. E., & Konstantopoulos, S. (2010). The impact of a project-based science curriculum on minority student achievement, attitudes, and careers: The effects of teacher content and pedagogical content knowledge and inquiry-based practices. Science Education, 94 (5), 855887. doi:10.1002/sce.20391

Lou, S. J., Liu, Y. H., Shih, R. C., & Tseng, K. H. (2011). The senior high school students' learning behavioral model of STEM in PBL. International Journal of Technology and Design Education, 21 (2), 161-183. doi:10.1007/s10798-010-9112-x

Project Wet. (n.d.). Discover the incredible journey of water through the water cycle. Retrieved June 16, 2017, from http://www.projectwet.org/resources/materials/discover-incredible-journey-water-through-water-cycle

Rogers, M. M., Cross, D. I., Gresalfi, M. S., Trauth-Nare, A. E., & Buck, G. A. (2011). First-year implementation of a project-based learning approach: The need for addressing teachers' orientations in the era of reform. International Journal of Science & Mathematics Education, 9 (4), 893-917. doi:10.1007/s10763-010-9248-x

Scogin, S. S., Kruger, C. J., Jekkals, R. E., & Steinfeldt, C. (2017). Learning by experience in a standardized testing culture: Investigation of a middle school experiential learning program. Journal of Experiential Education, 40 (1), 39-57. doi:10.1177/1053825916685737

Smith, P. S., Trygstad, P. J., & Banilower, E. R. (2016). Widening the gap: Unequal distribution of resources for K-12 science instruction. Education Policy Analysis Archives, 24 (8). doi:10.14507/epaa.24.2207

Varelas, M., Kane, J. M., & Wylie, C. D. (2011). Young African-American children's representations of self, science, and school: Making sense of difference. Science Education, 95 (5), 824-851. doi:10.1002/sce.20447

About the Author

Shannon N. Giesige graduated in 2017 from the University of Toledo with a Master of Education Specializing in Secondary Science. She teaches eighth grade science in Cincinnati. In 2012, she graduated from Bowling Green State University with a Bachelor of Science in Biochemistry and Scientific and Technical Communications.