# Problem-Based Learning: The Benefits and Challenges of Implementing PBL in a Grade 7 Class

Joey Turco

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As teachers we are always striving to become better at educating our youth. We spend countless hours discussing, researching, attending professional workshops, and re-evaluating our profession in order to benefit our students and to perfect our pedagogy. The way we teach our youth can have dramatic effects on their lives. We strive to create analytical and critical thinkers who are capable of solving the most difficult of problems, thus we look for the best possible means to achieve this. Different learning theories throughout the years have been studied and put into place in hopes that they will provide our students with inspiration, motivation, and a love for learning. Many teachers, to achieve these lofty goals, have utilized Problem-Based Learning (PBL). PBL is one such learning theory based on constructivist principles that allows for student-centered and situated learning. Some studies have been critical of PBL. Other studies have argued that PBL is an excellent tool that a teacher can utilize in the classroom to create critical thinkers and effective problem solvers.

In this paper I plan to critically analyze Problem Based Learning and answer the question "what challenges do teachers face when implementing the constructivist method of PBL in the classroom?" I will define constructivism and PBL and discuss their basic principles while reviewing some existing literature on these topics. I will also examine my own use of PBL and discuss the difficulties teachers face when implementing PBL and how teachers can overcome these difficulties.

According to Savery and Duffy constructivism is, "a philosophical view on how we come to understand or know" (Savery & Duffy, 2001). Savery and Duffy have broken constructivism down into three sections. Firstly, they state that, "understanding is in our interactions with the environment." Secondly, they stress that "cognitive conflict or puzzlement is the stimulus for learning and determines the organization and nature of what is learned." Lastly, they acknowledge that "knowledge evolves through social negotiation and through the evaluation of the viability of individual understandings" (Savery & Duffy, 2001). In other words, Savery and Duffy have pinpointed that we learn from our interactions with our environment, we learn when we have questions or puzzlement about a situation, and our knowledge changes based on other individuals' views and widespread beliefs. Furthermore, constructivism requires that learners collaborate with one another in order to hear alternative ideas. It is important for learners to have their beliefs and views challenged in order to further rouse their desire to learn (Savery & Duffy, 2001).

Problem-Based Learning is a learning theory, which encompasses many constructivist-learning methods. It was originally developed in the 1960's for use with medical education. (Wee, K.N., Kek, Y.C., Sim, H.C., 2001). Since this time, PBL has evolved to include other disciplines. Wee *et al.* acknowledge that, "Problem-Based Learning (PBL) is the learning that results from the process of working toward the understanding or resolution of a problem" (Wee *et al*., 2001). With PBL, students are placed in small groups and given a problem to solve. It is highly critical within PBL that the problem the students are given is both authentic and

challenging. Savery and Duffy (2001) stress that the problem given to the students should be applicable to the real world environment so as to give the students a purpose for their learning.

The role of students in PBL is to become independent, self-directed, and active learners who are responsible for their own learning. In groups, students discuss, share, and analyze the problem and then later disperse to conduct research on their own. Students then reconvene to share any more information that they have retrieved. The role of the teacher in PBL is to facilitate, support, and challenge the thinking of the learner to help develop students' metacognitive skills. The teacher should not offer any opinions. Instead, the teacher should ask the students questions such as "why?" and "what do you mean?" in order to challenge the students thinking (Wee *et al*., 2001).

In my own teaching practice I have used PBL very successfully and continue to do so. Presently, I am teaching my students a unit in Science 7 regarding the Earth's crust. We have completed some introductory lessons and now I have divided the students into groups of 4 and assigned each group two to three components of the Earth's structure. Students must research their assigned components and design a board game that could teach the core concepts of the components to other students. The students will then share their board game with the rest of the class and each group will have a chance to play the other groups' games. Furthermore, included in the students' guidelines are the criteria that they must incorporate the use of integers, a concept they have been learning in math. The students must self-

monitor in order to ensure that the problem is solved. Students are to meet with their group to research, discuss, design, and implement board game rules. They must assign tasks for each group member to be responsible for. As Wee *et al*. note, "Some of the information is obtained by investigating the problem, making observations, conducting primary and secondary research, asking questions, probing and investigating" (Wee *et al*., 2001). The students have already been introduced to the Earth's crust and this exercise is trying to build upon their prior knowledge. My role in the process of this assignment is to facilitate the groups and to make sure that they are all on task. I ask questions and probe students when I feel that students need guidance. Overall the project has been quite successful. However there have been some issues cropping up. As with any teaching method there are benefits and concerns. I will discuss these issues in the next section.

PBL requires students to be self-motivated in their quest for knowledge. As Wee et al. point out,

> *Students must assume responsibility for their own learning. They identify what they need to know and determine where and how to acquire the information to solve the problem. They are not provided with solutions or information on where and how to get it. They need to research and study on their own. They learn to take on responsibility for their own work performances similar to what they will do when they graduate and enter the workplace (Wee et. al., 2001).*

As I teach the oldest grade in elementary school I can see that in some ways there are age limitations for PBL. Students must possess a certain level of maturity in order to be responsible for anything, including their own learning. At times, even my students who are in grade 7 (the highest grade in elementary school) do not motivate themselves well. I consider them to be novice learners. They are still learning the skills of motivation and responsibility. I believe PBL can build upon these skills by engaging students with very relevant questions. However, as I have witnessed, sometimes a student will still struggle with self-direction. I think this issue is something to keep in mind when using PBL. I also believe that although students may still be developing their sense of responsibility it is very positive for them to be exposed to PBL. A comfort level with PBL seems to enhance students' awareness of the need for self-guidance. I believe the teacher must be attuned to each individual learner's preparedness for this type of learning style and must encourage and guide students while still prompting self-guidance. Also, by introducing PBL early on students can become more familiar with its framework and process. Studies have shown that students have reported an increase in stress level using PBL for the first time in comparison to a lecture-based learning environment (Zumbach, Kumpf, and Koch, 2004). Thus, by using PBL in elementary school and frequently perhaps this stress and its negative effects can be reduced for students.

I believe that diversity in any classroom is always positive for students. It is representative of the world we live in and it grants many learning opportunities for students. However, when using PBL sometimes diversity presents a challenge. PBL

requires that students collaborate. This means that students of different academic levels and from different backgrounds must work together to meet a common goal. Students' differences can sometimes offset conflict. For example, I have had situations in which group work becomes about high academic achievers taking over the assignment or complaining about working with students who appear to be unfocused or low academic achievers. The students who are low academic achievers can, in turn, become even more unwilling or nervous about participating. When students can overcome these types of problems their diverse groups can lead to gaining different perspectives and approaches to questions. Hill and Samsonov look at the problems facing "at-risk" learners and PBL. They pose some solutions, which work towards the success of PBL. They state:

> *At-risk students may need greater guidance and support than not at-risk students to develop the skills necessary for effective collaboration within student-centered learning environments. Such support would require confronting the barriers to effective collaboration, such as those evidenced in this study, including the tendency by high achievers to avoid collaboration and the awkward interactions wherein students feel that collaboration amounts to being taught by their classmates. Open discussions of the issues involved in collaboration, modeling of effective tactics in a variety of situations, and reflection on effective collaborative experiences may help students acquire the values and skills necessary to support and be supported by their peers in student-*

*centered learning environments* (Hill & Samsonov, 2009).

I plan to keep these solutions in mind when I notice a student who is struggling with a PBL assignment. Problem Based Learning requires that the teacher facilitate lessons rather than just state facts, but the teacher should by no means be passive. Hill and Samsonov's solutions require the teacher to be active in guiding and confronting different problems students may be having with PBL. It is beneficial for there to be an open discussion forum when using PBL.

The assessment of students' learning is an essential aspect of teaching. It is a tool that provides teachers valuable information regarding students' abilities. Without the proper assessment of students' performance, teachers are unable to adapt their lessons to accommodate students' needs. Assessment in PBL can be incredibly challenging for teachers due to its nature. As was pointed out, students in PBL students work on projects in groups, focusing on solving a real life problem. As Jones points out one difficulty in assessing individuals who are engaged in PBL is "…problems are embedded within ambiguous conditions and have no single right answer" (Jones, 2002). Furthermore, since PBL is a learning theory interested in developing problem solving skills and less about rote memorization of information, teachers can have difficulty in assessing students' abilities. As Jones states, "…traditional tests or assessments of pure knowledge do not necessarily tap into the types of skills and abilities that PBL is intended to strengthen over time" (Jones, 2002). In my own teaching practice, I have had to rethink my assessment strategies

in order to accommodate PBL. Although, not impossible, assessment in PBL can be very challenging to teachers especially when considering time constraints.

There are many challenges faced when implementing PBL. I have found that when students are given the chance to use PBL they become very engaged with the question at hand and the process needed to answer it. However, PBL requires many elements in order for it to be successful. It is important for the teacher to stay on top of these aspects. I have discussed some of the elements that are challenging for novice learners and "at-risk" learners. The challenges faced with PBL require the teacher to be prepared to keep an open discussion. Also, it is important to recognize that, at first, PBL can be something students fear or have difficulty fully understanding. However, with time and real-world questions, students can gain a deep understanding and grasp of different concepts.

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