Developing Opportunity Youths' Literacy, Creativity, and Critical Thinking through PBSL: Facilitating Twenty-First-Century Learning and Mixed Realities

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Introduction

Problem-based service learning (PBSL) is an approach to literacy instruction recently proposed by the authors (2018) with the vision of promoting differentiated learning that exposes and encourages students to use twenty-first-century skills. Primarily guided by the principles of service learning, civic engagement, and problem-based learning, PBSL takes into consideration the skills learners—especially minority and underserved students—need today to be successful in their classrooms and will need in the future to be successful in their workplaces.

The PBSL model "highlights collaboration, critical thinking, deep learning, teamwork, oral and written communication, problem-solving, reflection, and the development of social skills" (Aker, Pentón Herrera, & Daniel, 2018, p. 166). These skills are necessary as our world becomes more interconnected and schools are tasked with educating learners to acquire global perspectives, skills, and knowledge. Furthermore, due to the flexibility of the model, PBSL can be incorporated in most subject area and disciplines at any level, not just literacy and language classes.

We propose PBSL as a viable framework for facilitating twenty-first-century learning and mixed realities. In particular, we purposefully focus on developing opportunity youths' literacy skills, creativity, and critical thinking in their classrooms. We explain the practical applications of PBSL and share examples of real-life PBSL projects that we have applied for this purpose. We also reflect on the opportunities PBSL offers for the academic development and achievement of **the opportunity youth population**.

Defining Opportunity Youth

We use the term *opportunity youth*—preferred over *at-risk students*—because we seek to capitalize on the positives (opportunities) instead of focusing on the negatives (risks). In addition, we refer to the terminology used by Bridgeland and Milano (2012) to describe opportunity youth as adolescents and young adults ages 16 to 24 who have a record of school truancy, are currently out of school and/or do not expect to enroll in the next year, "have not been employed for at least six months, do not hold a college degree, are not disabled to prevent long-term

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employment, are not incarcerated, and are not a stay-at home parent working with a spouse" (p. 9).

Opportunity youth are "bright, resilient, compassionate, and have the energy and creativity of youth and the digital native's comfort with technology—qualities in high demand by employers" (Browning & Sofer, 2017, p. 2). Effective pedagogy for opportunity youth needs to embrace and expand these traits by focusing on skills such as literacy, creativity, and critical thinking but also must address the challenges this population faces, including lack of quality education, lack of career-ready skills, and lack of social relationships (Corcoran, Hanleybrown, Steinberg, & Tallant, 2012). Fortunately, PBSL combined with mixed realities addresses both the opportunities and challenges facing these youth.

Defining Mixed Realities

Milgram and Kishino (1994) described mixed realities (MR) as a continuum between the authentic and virtual environments. Following Rosa's (2015) more recent definition, which focuses on blending the virtual and physical worlds, leads us to reclassifying the intersection of these spaces—such as libraries—as mixed reality spaces. It seems creative MR spaces are as close as the nearest Starbucks. The State University of New York (SUNY) *FACT[2] Mixed Reality Task Group Final Report* (2018) lists hardware and software options for mixed realities in the classroom and suggests storytelling as a vehicle for exploration. Currently, researchers in Germany and Canada are studying mixed realities and journalistic storytelling; we provide more information concerning narrative creation in our example of PBSL and mixed realities below.

Practical Application of PBSL

In this section we introduce the practical applications of PBSL, that is, how PBSL can be used in any learning environment. For this, we suggest factors to consider prior to implementing PBSL and

provide a step-by-step process that can help and guide educators and students, through the implementation of PBSL activities in the classroom and in the community. An important clarification: when we use the word *students* we are referring specifically to opportunity youth students.

Problem-Based Learning Component

The first step of the PBSL process is the problem-based learning (PBL) component. For the PBL component, educators and students choose a topic they find problematic and meaningful. These problems can come from a variety of sources, including journals, books, textbooks, movies, newspapers, magazines, and/or real-life situations. As recommended by Duch, Groh, and Allen (2001) and the Center for Innovation in Teaching and Learning (CITL) at the University of Illinois (n.d.), teachers and students should consider these procedures for successful implementation of the PBL component:

1) Choose a central idea, concept, or principle that is meaningful to the individual/group while aligning it to the curriculum (when applicable). Then, think of an end-of-chapter problem or homework that is usually assigned to students to help them learn that concept. List the learning objectives that students should meet when they work through the problem.

2) Think of a real-world context for the concept under consideration. Develop a storytelling aspect to an end-of-chapter problem or research an actual case that can be adapted, adding some motivation for students to solve the problem. More complex problems will challenge learners to go beyond banal answers. Look at diverse multimodal resources for ideas on the storyline. Some PBL practitioners talk to professionals in the field being studied in order to find ideas of realistic applications of the concept being taught.

3) The problem needs to be introduced in stages so that students will be able to identify learning issues that will lead them to research the targeted concepts. The following are some questions that may help guide this process:

   a. What will the first page (or stage) look like? What open-ended questions can be asked? What learning issues will be identified?

   b. How will the problem be structured?

   c. How long will the problem be? How many class periods will it take to complete?

   d. Will students be given information in subsequent pages (or stages) as they work through the problem?

   e. What resources will the students need?

   f. What end product will the students produce at the completion of the problem?

4) Write a teacher's guide detailing the instructional plans for using the problem in the course. If your class is medium-to-large, a combination of mini-lectures, whole-class discussions, and small group work with regular reporting may be necessary. The teacher's guide can indicate plans or options for cycling through the pages of the problem, interspersing the various modes of learning.

5) The final step is to identify key resources for students. Students need to learn to identify and utilize learning resources on their own, but it can be helpful if the instructor indicates a few good sources to get them started. Many students will want to limit their research to the internet, so it will be important to guide them toward the library and the physical resources available there as well.

Taking into consideration these factors and questions , we recommend five steps that teachers and students should follow when navigating through the PBL component:

1. **Identify:** Identify the problem. Why are you or your team choosing this problem? Why is it meaningful? Why is it a problem? How does it relate to your course, class, or curriculum? Is this a problem you can realistically work through?

2. **Learn:** Learn about this problem. Listen to classmates, colleagues, teachers, and others affected by this problem. Pay attention to how they see and understand this problem that directly affects them and have an open mind through the listening process. Be fully engaged in only listening and stop yourself from analyzing at this point.

3. **Research:** Now it is time to do your own research! Take into consideration everything you learned in Step 2 and do individual/group research about this problem. Look for its origin; how was it created? What strengthens it? Dissect the problem in such a way that can be explained in this paragraph format:

> The problem I chose is _____. I have learned that this problem first occurred _____. The factors strengthening this problem are _____. Some actions taken towards resolution have been (if applicable) _____. Three scientific/scholarly resources I need to fully read to become more knowledgeable are _____.

4. **Reflect:** Reflect on your problem, what you have listened to and heard, and what you have researched. First reflect individually, then, if applicable, reflect as a group. In this step you are not reflecting on possible solutions, you are only reflecting on and sharing the information you have learned and your findings.

5. **Find a solution:** Find a solution to the problem! In this step, similar to step 4, first find a solution individually, then if applicable, join your group, take turns sharing your individual solutions, and compromise on a group solution that takes into consideration all of your individual solutions. Figure 1 shows PBL and twenty-first-century skills used in PBSL projects. PBL cores are highlighted in red.

Service-Learning Component

The second step of the PBSL process is the service-learning (SL) component. In SL, educators and students choose to respond to a need identified by—or in—their community while reinforcing their academic learning objectives in an authentic environment (Macknish, Tomaš, & Vojtkuľáková, 2018). Within the PBSL framework, SL is the continuation of the PBL component because it is where the solution(s) identified in the first step can be implemented to make a positive impact in the learners' communities. To implement the SL component successfully , we follow Perren's (2013) seven steps of strategic planning service learning:
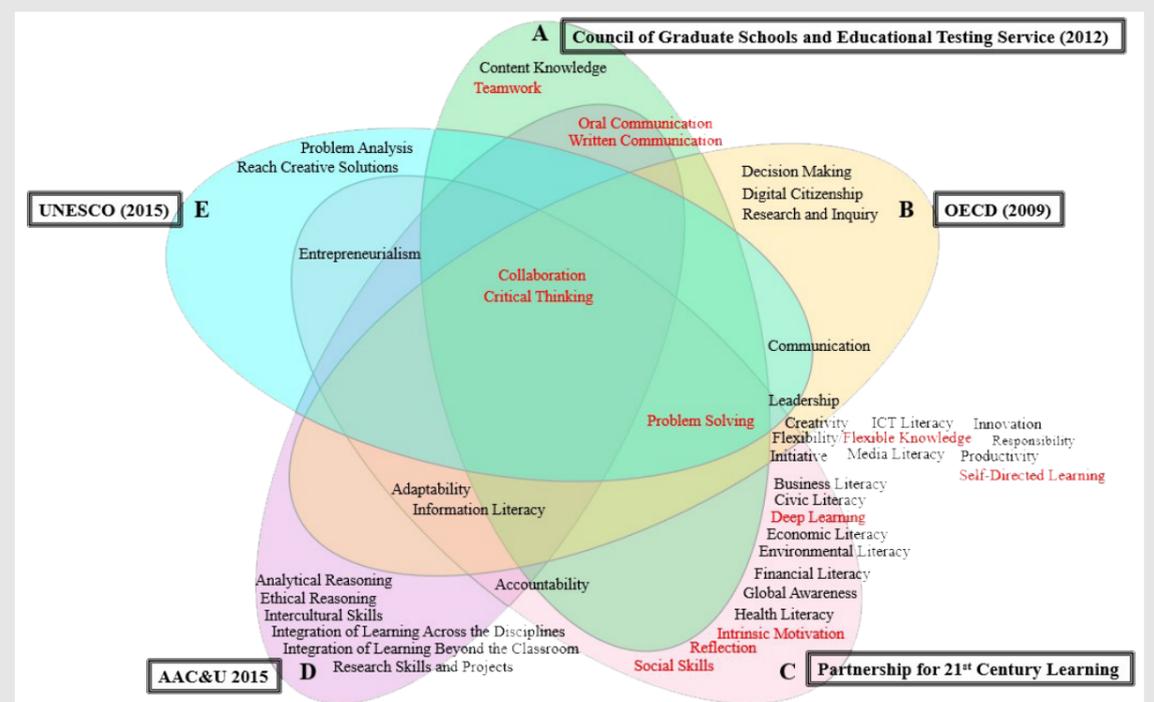

Figure 1: Venn diagram of twenty-first-century skills: PBSL skills in red

1. Planning and logistics

2. Obtaining materials and developing background

3. Preparing for field experiences

4. Implementing field experience and civic engagement

5. Reflecting and connecting

6. Diversifying and repeating

7. Expressing gratitude and evaluating

For an example of how to use these seven steps in PBSL projects, see Aker, Pentón Herrera, and Daniel (2018).

Example of PBSL with Mixed Realities and Twenty-First-Century Learning

The introduction of PBSL to the class is critical. As instructors, if we are not excited about the student-centered process or if the problems are not authentic and challenging, how can the students be motivated to learn? We begin by explaining PBSL and why it was chosen as the instructional strategy for the class. Indeed, many of the skills utilized during the process of PBSL are the same skills students will need in their future workplaces (Aker, Pentón Herrera, & Daniel, 2018). As the students learn the technique, they are practicing skills they will actually use in the future. Additionally, service learning is embedded in PBSL; during the process, students build lifetime community service skills.

The Hopi Migrations: PBSL Project

Learning research skills was one of the learning objectives of the course. During the first week, we introduced PBSL to the class by

describing the authentic problems in depth. Next, because choice can be motivational (Wang & Eccles, 2013), students selected a problem and completed a writing and reading inventory. The students were then assigned PBSL groups according to their preferences. PBSL collaboration began by querying the group to assess what was known about the problem. Then, the group explored the problem and divided the information discovered into chunks to be individually researched.

A group of five opportunity youth students chose to study Hopi migrations. The questions they formulated were the following: How could the migrations of the Hopi peoples be researched? What traces did the ancient peoples leave behind that could be traced through the literature? To begin the research process, a range of articles focusing on Hopi migrations and links were provided; Google alerts were created for each problem.

The PBSL group chose to study the migrations of the Hopi by following clan symbols in the literature; Hopi clans used unique symbols and left behind an evidence trail of their habitation in the form of petroglyphs, called tutuveni (Hill, Sekaquaptewa, Black, Malotki, & Lomatuway'ma, 1998). Over the years, archaeologists identified alternative functions of petroglyphs, also called "rock art." To narrow the search, Bernardini (2016) recommended only considering symbols associated with fourteenth-century Pueblos and limiting the search to the classic symbols recorded by Fewkes (1897), Colton and Colton (1931), Colton (1960), Michaelis (1981), and Olsen (1985). The common characteristics of these symbols include isolation, simplicity, limited topics, and repetition. Utilizing their research skills, each student chose a clan and, using journal articles, plotted the migration of their clan (Fewkes, 1897, p. 8). When the group convened, members charted the individual clans on a map to see the movement of the peoples.

FIGURE 3: EXAMPLE OF PBSL HOPI GROUP'S SCRATCH CODING PROJECT.

For the service-learning component, the group contacted elementary classes in the community studying the Hopi. They made presentations to individual classes about the migration of the Hopi and described the research techniques they used. Upon reflection, the group decided they had utilized problem-solving, collaboration, critical thinking, deep learning, and creativity. Figures 2 and 3 show two examples of the work produced by the students in this project.

The Hopi Migrations: Integrating Mixed Realities

This PBSL group used the research skills they learned to expand the migration story to other native peoples following pottery trails utilizing the Scratch programming environment demonstrating mixed realities. However, it is important to explain that, because MR is flexible and can be used to enhance learning experiences, the student group could have also chosen to use other programs such as Second Life, a tagging photo project, Google Cardboard, memes, or myriad other techniques provided in the SUNY (2018) report. Interestingly, Cross (2018) found that working in a MR space spawns creativity.

Clan Symbols: Hopi Totemic Signatures

Bear   **Lizard**   **Water/cloud**

Snake   Sun   Corn   Rabbit

FIGURE 2: HOPI CLAN SYMBOLS.

Conclusion

Effective PBSL pedagogy and MR learning for opportunity youth is science-based, provides differentiation for skill development, integration of content skills, and supports ongoing practice (Jones, 2008). Thus, with the vision of promoting differentiated learning experiences as well as exposing and encouraging opportunity youth to use twenty-first-century skills, PBSL takes into consideration the skills learners need to be successful in their classrooms today and will need to thrive in the workplaces in the future. Addressing and collaboratively solving authentic, ill-structured problems (PBL) and incorporating community service (SL) following the PBSL model creatively provides a bright future for our students. To get started, a dose of creativity and innovation is suggested.

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PBSL, combined with MR, can be a powerful vehicle for creative learning because it encourages imagination to solve authentic problems. To jump-start the future, the OECD (2018) recommends developing a creative and innovative space designed to encourage experimentation and collaboration. For example, the National Academies Keck Futures Initiative (2018) developed a powerful futures model framework utilizing an annual conference and seed grant to support interdisciplinary creativity through collaboration to open "new imaginative paths toward addressing the world's increasingly complex problems and creating a hopeful future" (p. 71). For educators, creative collaborative spaces can also take the form of pedagogic collaboration.

The authors of this article envision instruction that is rigorous, immersive, and engaging to provide differentiated PBSL learning and MR experiences. It is our belief that PBSL addresses fundamental components of students' cognitive-social-emotional development for academic and future work settings. Furthermore, PBSL and MR strengthen students' cognition and equip pupils to manage learning collaboratively (Aker, Pentón Herrera, & Daniel, 2018; Jones, 2008). It is our hope that PBSL, combined with MR, is considered as a viable framework to use when teaching learners at all levels—especially opportunity youth—to better equip them with the knowledge and skills they need today and in the future to be successful learners and professionals.

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