Problem-Based and Project-Based Learning: Promoting Differentiated Instruction

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Abstract: Contemporary education strives to make our students not only knowledgeable, but demands that they understand and know the utility of the acquired knowledge. As a result, content acquisition no longer holds value if it is not applicable in the real world. The 21st century has posed several challenges to today’s educators. Political leaders have mandated teachers to create an active learning environment enriched with various teaching styles in order to reach out to all students, while still maintaining the instruction at a rigorous standard. This paper proposes a solution to these current educational quandaries, two paradigms applicable to all learning styles; problem and project-based learning.

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Educational research and case studies demonstrate the numerous positive effects that problem-based and project-based learning has on the 21st century learner. These two instructional approaches provide the teacher with several advantages that come with some minor challenges. However, providing the right kind of training allows teachers to properly implement problem and project-based learning in their classrooms. Subsequently, with practice teachers will learn how to identify and rectify these obstacles to sustain a rich constructivist environment. The first signs of problem and project-based learning dates back to 1908; nevertheless progressivist and constructivist educators have adequately modified it as demands in the educational system have changed. These instructional methods have proven to be effective in ancient, present, and future times. Its flexibility allows teachers to add technological advances to the learning modules making it ideal for the future era.

At the beginning of the 20th century, the general concept of education focused on ensuring that students became content knowledge experts in school, however entering the 21st century that way of thinking is no longer the reality. Contemporary education now strives to make our students not only knowledgeable, but demands that they understand and know the utility of that knowledge. Due to technological advances, information has become readily available and highly accessible. “Knowledge can no longer be treated as a value-free commodity,” and as result curriculum leaders are compelled to reform how they look and treat knowledge (Wiles & Bondi, 2011, p. 23). Everyone involved in the school community should understand that learning and teaching must be made relatable to students so they can in turn be ready to apply it in real life scenarios. The 21st century motivates the learner to explore and create. Therefore the paradigm of education has transformed from passive learning to active learning (Wiles & Bondi, 2011). In order to successfully execute this change, the curriculum needs to be enhanced with problem and project-based learning activities. Educational research has concluded that these types of activities help the learner enhance their critical thinking skills, shaping them into autonomous, productive, law abiding citizens. In order to implement these activities properly, one must identify the benefits, know how to rectify challenges, and understand what skills are being assessed to ensure that the learners are efficiently obtaining the desired outcomes.

From a historical perspective, the use of projects in educational instruction dates back to 1908, when Rufus Stimson, a teacher in Massachusetts, created the term “home projects” (Colley, 2008, p. 24). These “home projects” started the great innovation of projects in which...
they instructed children to apply the school’s teaching in their homes, thus making their acquired knowledge for the day retainable and relevant. This concept was further strengthened by the work of John Dewey, Piaget and Vygotsky. The father of progressivism, along with the constructivist educators, modified and perfected this notion of “learning by doing,” hence establishing the curricular and psychological foundation of problem based learning. These highly esteemed educators created a movement in history by establishing a learning tactic that facilitated their students to reach their highest potential. Their ideologies have withstood the test of time as they are still prevalent in today’s educational world, now more than ever. Generation after generation, these instructional methods have slowly evolved in the educational system. As a result, the art of active learning now entails a curriculum enriched with problem and project-based learning, each with its own set of applied skills (Colley, 2008).

Teachers tend to confuse project-based and problem-based learning and mistakenly believe they serve the same purpose. However, both styles of learning have explicit key differences. In order to use these approaches appropriately, teachers must understand what skills both of these approaches employ. To begin with, project-based learning is an instructional strategy in which students work cooperatively over time to create a concrete, substantial product. The final product can be done via a presentation or performance. Additionally, teachers can easily modify project-based learning to fit the learners’ own interests and abilities. Project-based learning is easy to follow and its flexibility enables teachers to address every child’s needs. This methodology stimulates students to heighten their cognitive skills by collecting, analyzing information, and making self-discoveries by reporting their results. Contemporary educators are more interested in the process of thinking rather than the answer, thus making this an ideal tool to use.

On the other hand, problem-based learning is an instructional tactic which allows students to work communally in order to investigate and resolve an ill-structured problem based on real world issues. The steps involved in problem-based learning permit the student to use inductive and deductive reasoning as they probe and refine a possible solution to an identified problem. Rigorous national standards and high stakes assessments have compelled schools to convert from teacher-centered to student-centered institutions where teachers are mandated to encourage their students to make sense of their learning (Hanney & Savin-Baden, 2013). Fortunately, both of these frameworks are suitable for the needs and demands of present-day society. As a matter of fact, a case study conducted in the United Kingdom in 2012 revealed that a collaboration of both project and problem-based learning resulted in the best outcomes versus using them individually. The investigation disclosed that project and problem-based learning stand weak as one, but when combined, the results are amplified. Merging both of these instructional schemes improve students’ engagement and criticality in the learning process (Hanney & Savin-Baden, 2013).

Project-based learning and problem-based learning have an array of benefits, in fact many educational researchers have exhorted that these two approaches are a must in the 21st century classroom. Over the past decade, the composition of this nation’s population has immensely diversified. As a result, present day teachers have the added pressure to teach all ethnically and linguistically diverse students. Similar predicaments emerge in schools located on the border, however studies have concluded that project-based learning has positively impacted Hispanic students by increasing their academic performance. West and Donna (2012), acknowledged that Hispanic students have a higher rate of failing because of the language barrier, however they have discovered that real-world problem-based community engagement projects is a great alternative to integrate critical thinking skills and language acquisition (West & Donna, 2012, p.123). Engaging students to become problem solvers in their community invigorated their learning into a meaningful one and as a result test grades improved (West & Donna, 2012). An additional benefit is that instructional methods like problem and project-based activities allow teachers to apply differentiated learning instruction in their classroom. Applying such approaches permits students to strengthen their skills while facilitating them to learn at their own level, thus making project-based and problem-based learning an iconic paradigm applicable to all multiple intelligences (Bell, 2010). In addition, educational experts agree that this style of methodology integrates college readiness skills into the curriculum. Scholastic reforms have exhorted the urgency to produce life-long learners; therefore many curriculum experts favor the usage of problem and project-based learning in their institutions. In fact, these two instructional designs were tested in a University in Australia to confirm if both approaches were also applicable in a higher, more rigorous class setting. Two cohorts of graduate engineers from the School of Civil, Environmental and Chemical Engineering represented the variables in this experiment. The first group operated under a traditional curriculum and the second group worked on project based and problem based modules. Results concluded that the second group encountered a more successful learning experience;
students claimed that they felt “work ready” unlike the first cohort (Jollands & Molyneaux, 2012, p. 145). Students under the problem based learning claimed that it had expanded their work skills, enhanced their creativity and increased their self-esteem preparing them for the workforce (Chunfang, 2012). Researchers concluded these students demonstrated better communication skills, problem solving and managerial skills. Science has indeed asserted that these two instructional models add rigor and relevance in any class setting, declaring it a universal instructional paradigm (Jollands & Molyneaux, 2012).

The previous discussions demonstrate the strengths of problem-based learning in developing creativity. However, some professors encounter challenges when using these styles of learning. A weakness of problem and project-based learning exists in some instances where students lack the explicit knowledge of creativity. “Explicit knowledge includes language, tools, documents, images, symbols and well defined roles that various practices make explicit for a variety of purposes” (Chunfang, 2012, p. 490). Teachers will inadvertently assume that every student understands what the process of creative thinking implies, and will tend to overlook the learners who have difficulty grasping the concept. It is very difficult to describe the creative process to students who may not be used to participating in the creative process by themselves. However, neglecting this deficit will lead students to lose the meaning of genuine learning when performing problem and project-based activities. The solution to this would be to instruct teachers to take the time to model and guide their students on how to correctly perform a problem or project- based assignment before cutting them loose (Chunfang, 2012). In addition, another limitation found in problem and project-based learning is how teachers respond to the challenges of constructivist environments when implementing these two instructional models. In a traditional environment, the teacher will play an authoritative role and is viewed as the knowledge source. Teachers will tend to use summative assessments to grade the learners. On the contrary, in a constructivist environment, the teachers become a facilitator, where students are placed in a liberal setting allowing them to explore. Consequently, this educational philosophy will utilize authentic student products as assessments. As a result, some teachers have complained that the problem and project-based learning tasks are often “messy” and “unorganized,” adding that the students’ products are difficult to evaluate. Teachers must be informed that they have the ability to shape problem and project-based’s learning tasks to match their own preferred styles. In order to eliminate the degree of frustration professed by some teachers, Rosenfeld & Rosenfeld (2006) stated that encouraging teachers to attend problem and project-based learning workshops will help teachers understand how to use and tweak these modules to fit their classroom environments. However, special attention must be placed when selecting or creating these workshops. The workshops must specifically delineate the following four goals; otherwise benefits will not be gained. Workshops need to clearly define the two models of learning styles, encourage teachers to explore their own learning style profiles, allow them to share personal insights based on the implementation of the problem and project-based learning modules, and permit teachers to reach their own responses to the two learning environments (Rosenfeld & Rosenfeld, 2006). As one can envision, problem and project-based learning may bring forward some challenges, however instructing educators to identify these challenges will safeguard the integrity of problem and project-based learning.

In conclusion, empirical evidence shows that fusing problem and project-based learning will heighten the quality of learning in the classroom. Problem and project-based learning is centered on authentic and meaningful learning. Additionally, teachers could use these instructional designs to track student’s progress. It promotes students to self-assess their work and helps them to identify their areas of weaknesses and strengths. After areas of improvement are detected, the teachers can collaborate with the student to create a plan of action to address the areas of concern. This formative assessment will advocate students to become autonomous independent thinkers (Trauth-Nare & Buck, 2011). In addition, problem and project-based learning can readily incorporate the usage of media to enhance skills on reading, writing, and other disciplinary content. In this day and age, students are compelled to “create” their own learning, and this could be accomplished through the creation of videos. The new information age is upon us and problem and project-based learning prepares our students to prosper in this media-rich society (Spires, Hervey, Morris, & Stelpflug, 2012). Evidently, problem based and project-based learning are declared the best teaching methods in the 21st century, the fact that these models can easily be modified to fit present and future times, asserts that these instructional doctrines are timeless.
REFERENCES


