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Project Learning Practice

Balmukunda Upadhayay

Abstract

Project work involves content, products, and processes. Teacher educators may notice that those new to project work adopt ideas and practices related to content and products more readily than they adopt ideas and practices related to the processes embedded in good project work. To fully implement the project approach, teachers need to develop an understanding of the underlying dynamics of the processes of project work. It defines projects, provides a brief history of the project approach, processes of having project work, and discusses some benefits of the approach. It then goes on to discuss challenges to implementing the project approach, the teacher's role in project work, and students' participation in the project approach.

Key words: Project, Learning, Teaching, Teacher, and Learner

Introduction

Modern science continues to develop in such a way that the older generation is constantly trying to catch up with the younger generation's adaptation to new developments and technologies. It is only logical that we should utilize our students' familiarity with technology from a young age to maximize their engagement and learning by integrating it into our curriculum.

Project-based learning (PBL) is a model that organizes learning around projects. According to the definitions found in PBL handbooks for teachers, projects are complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations (Jones, Rasmussen, & Moffitt, 1997; Thomas, Mergendoller, & Michaelson, 1999).

Project learning, also known as project-based learning, is a dynamic approach to teaching, in which students explore real-world problems and challenges, simultaneously developing cross-curriculum skills, while working in small collaborative groups. It is particularly because project-based learning is filled with active and engaged learning, it inspires students to obtain a deeper knowledge of the subjects they're studying. Project work also indicates that students are more likely to retain the knowledge gained through this approach far more readily than through traditional textbook-centered learning. In addition, students develop confidence and self-direction as they move through both team-based and independent work.

Project-based learning grabs hold of this idea and fosters deep learning and autonomy by

using technology to help students engage in issues and questions relevant to their lives. This resource will direct you to a variety of resources on this approach, the research behind it, and how you can use it in your class to transform your students into engaged and interested independent thinkers. Students also thrive on the greater flexibility of project learning. In addition to participating in traditional assessment, they might be evaluated on presentations to a community audience they have continuously prepared for, informative tours of a local historical site based on their recently acquired expertise, or screening of a scripted film they have painstakingly produced.

In the process of completing their projects, students also polish their organizational and research skills, develop better communication with their peers and adults, and often work within their community while seeing the positive effect of their work. Because students are evaluated on the basis of their projects, rather than on the comparatively narrow rubrics defined by exams, essays, and written reports, assessment of project-based work is often more meaningful to them. They quickly see how academic work can connect to real-life issues -- and may even be inspired to pursue a career or engage in activism that relates to the project they developed.

Adopting a project-learning approach in your classroom or school can energize your learning environment, energizing the curriculum with a real-world relevance and sparking students' desire to explore, investigate, and understand their world.

History

Confucius and Aristotle were early proponents of learning by doing. Socrates modeled how to learn through questioning, inquiry, and critical thinking -- all strategies that remain very relevant in today's PBL classrooms. Fast-forward to John Dewey, 20th-century American educational theorist and philosopher, and we hear a ringing support for learning that's grounded in experience and driven by student interest. Dewey challenged the traditional view of the student as a passive recipient of knowledge (and the teacher as the transmitter of a static body of facts). He argued instead for active experiences that prepare students for ongoing learning about a dynamic world. As Dewey pointed out, "Education is not preparation for life; education is life itself." The original problem-based learning model was developed for use with medical students in Canada (Barrows, 1992). More recently, the "problem-based learning" model has been extended to mathematics, science, and social studies classes at the elementary and secondary level (Stepien & Gallagher, 1993).

Project-based learning emerged more than half a century ago as a practical teaching strategy in medicine, engineering, economics, and other disciplines. With this approach, students are challenged to solve problems or do simulations that mimic real life. Although problems are defined in advance by the instructor, they tend to be complex, even messy, and cannot be solved by one "right" or easy-to-find answer. This is how medical students, for instance,

learn to diagnose and treat actual patients -- something they can't learn in a lecture hall. Unlike textbook-driven instruction, problem-based learning puts the student in charge of asking questions and discovering answers.

Fairly early in the 20th Century, John Dewey wrote extensively about the impact of experience on learning in *Experience and Education* (1938). His work on the impact of experience on a child's education is foundational to the formation of project-based learning, as we know it today. Dewey's work focused on a theory of experience that challenged both traditional and progressive forms of education. However, he posited that not all experience was actually educationally valuable; it could be "miseducative" if it was not structured appropriately (p. 25). This structure was based upon the interaction of two founding principles of experience: continuity and interaction (p. 10). Continuity states that all experiences are carried forward and influence all future experiences (p. 35) and interaction refers to the internal conditions of an experience (p. 42). These principles become the framework upon which the educator makes judgments as to the value of an educational experience. The educator has to ensure that the surroundings are conducive to moving the experience forward.

In the past decade, project-based learning (PBL) has increasingly been trialed and adopted across a diversity of educational institutions worldwide. In school education PBL is notably widespread in different disciplines, however PBL has already been introduced in pure science; for instance in developed countries, most engineering institutions incorporate PBL to some extent. PBL's history also confirms its use across a breadth of disciplines in differing national contexts, including Media and Business Studies, Geography, Environmental Science, Education, Information Technology and Sustainability.

Suzie Boss (2011) points out that Maria Montessori launched an international movement during the 20th century with her approach to early-childhood learning. She showed through example that education happens "not by listening to words but by experiences upon the environment (p. 1)." The Italian physician and child-development expert pioneered learning environments that foster capable, adaptive citizens and problem solvers. Jean Piaget, the Swiss developmental psychologist, helped us understand how we make meaning from our experiences at different ages. His insights laid the foundation for the constructivist approach to education in which students build on what they know by asking questions, investigating, interacting with others, and reflecting on these experiences.

A number of trends have contributed to the adoption of project-based learning as a 21st-century strategy for education. Cognitive scientists have advanced our understanding of how we learn, how we develop expertise, and how we begin to think at a higher level. Fields ranging from neuroscience to social psychology have contributed to our understanding of what conditions create the best environment for learning. Culture, context, and the social nature of learning all have a role in shaping the learner's experience. These insights help to explain the appeal of PBL for engaging diverse learners.

Although PBL applies across disciplines and diverse learners, it consistently emphasizes active, student-directed learning. Why is this approach more likely than rote memorization to lead to deeper understanding? Relevance plays a big role. Projects give students a real-world context for learning, creating a strong "need to know." Motivation is another factor. Projects offer students choice and voice, personalizing the learning experience. By design, projects are open-ended. This means students need to consider and evaluate multiple solutions and, perhaps, defend their choices. All these activities engage higher-order thinking skills.

Project-based learning has evolved as a method of instruction that addresses core content through rigorous, relevant, hands-on learning. Projects tend to be more open-ended than problem-based learning, giving students more choice when it comes to demonstrating what they know. Unlike projects that are tacked on at the end of "real" learning, the projects in PBL are the centerpiece of the lesson.

Finally, today's students will face complex challenges when they complete their formal education. Knowing how to solve problems, work collaboratively, and think innovatively are becoming essential skills -- not only for finding future careers but also for tackling difficult issues in local communities and around the world.

Process

Project-based learning is a teaching method, in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an engaging and complex question, problem, or challenge. Projects are typically framed with open-ended questions that drive students to investigate, do research, or construct their own solutions. For example: How can we reduce our school's waste products? How safe is our water? What can we do to protect a special place or species? How do we help people from the impact of disasters? Students use technology tools much as professionals do -- to communicate, collaborate, conduct research, analyze, create, and publish their own work for authenticity. Instead of writing book reports, for instance, students in a literature project might produce report to publish on notice board, post them on a social media, and invite responses from a partner class in another place or community. The processes of project work include.

- a) **Key knowledge, understanding, and success skills** - The project is focused on student learning goals, including standards-based content and skills such as critical thinking/ problem solving, collaboration, and self-management.
- b) **Challenging problem or question** - The project is framed by a meaningful problem to solve or a question to answer, at the appropriate level of challenge.
- c) **Sustained inquiry** - Students engage in a rigorous, extended process of asking questions, finding resources, and applying information.
- d) **Authenticity** - The project features real-world context, tasks and tools, quality standards, or impact – or speaks to students' personal concerns, interests, and issues in their

lives.

- e) **Student voice & choice** - Students make some decisions about the project, including how they work and what they create.
- f) **Reflection** - Students and teachers reflect on learning, the effectiveness of their inquiry and project activities, the quality of student work, obstacles and how to overcome them.
- g) **Critique & revision** - Students give, receive, and use feedback to improve their process and products.
- h) **Public product** - Students make their project work public by explaining, displaying and/or presenting it to people beyond the classroom.

Practice

Today's students, more than ever, often find school to be boring and meaningless. In PBL, students are active, not passive; a project engages their hearts and minds, and provides real-world relevance for learning. Project-based learning focuses on in-depth investigations. Project-based learning forces the discussion of breadth versus depth to resurface. The in-depth investigations require more time, so less time may be spent on other content in the curriculum. By beginning slowly, teachers can design projects that reflect state or national objectives and continue to meet standards. Kean and Kwe (2014) point out that adopting PBL "enables teachers to bridge academic instruction with real-life experience in communicating across cultures" (p. 191).

No doubt about it—project-based learning is both challenging and rewarding for the teacher. Projects build vital 21st-century skills and lifelong habits of learning. Student enthusiasm, confidence, social interactions, and motivation are noticeably improved during project work. Almost all the examples of project-based learning attempt to capitalize on the successes of cooperative or collaborative learning in some manner. Students that are inexperienced with working in groups may have difficulties negotiating compromise. If these methods have not been used before, then it may be necessary to teach learners how to interact within groups and manage conflict within groups.

When the project approach takes hold in the classroom, students gain opportunities to engage in real-world problem solving too. Instead of learning about any subject in abstract notion, students act as consultants to develop their practical action on particular problem. Rather than learning about the past from a textbook, students become historians as they make a documentary about an event that changed their community. Especially when it's infused with technology, project-based learning may look and feel like a 21st-century idea, but it's built on a venerable foundation.

Benefits

John W. Thomas (2000) points out that there is ample evidence that PBL is an effective

method for teaching students' complex processes and procedures such as planning, communicating, problem solving, and decision making, although the studies that demonstrate these findings do not include comparison groups taught by competing methods(p. 35).

The core idea of project-based learning is that real-world problems capture students' interest and provoke serious thinking as the students acquire and apply new knowledge in a problem-solving context. The teacher plays the role of facilitator, working with students to frame worthwhile questions, structuring meaningful tasks, coaching both knowledge development and social skills, and carefully assessing what students have learned from the experience. Advocates assert that project-based learning helps prepare students for the thinking and collaboration skills required in the workplace.

Another trend that is fueling interest in PBL is our evolving definition of literacy. Learning to read is no longer enough. Today's students must be able to navigate and evaluate a vast store of information. This requires fluency in technology along with the development of critical-thinking skills. PBL offers students opportunities not only to make sense of this information but also to expand on it with their own contributions. Suzie Boss (2011) points out that as PBL gains advocates and gathers momentum, the education community will continue to exchange ideas and collaborate on projects, making this powerful method of preparing students for the future even better (p. 1).

Linda Ramey (2013) points out that project-based community service learning increases the effectiveness of sustainability education and demonstrates the importance of providing children with opportunities to be healthy, happy and eco-literate global citizens (p. 1). PBL engages school students to foster skills and helps students to effectively address environmental dilemmas by integrating scientific content knowledge with civic engagement to best prepare sustainably literate citizens.

Edutopia (2008) presents that project-based learning creates opportunities for group of students to investigate meaningful questions, which require them to gather information and think critically. Typical projects present a problem to solve (How can we reduce the pollution in the schoolyard pond?); a phenomenon to investigate (Why do you stay on your skateboard?); a model to design (Create a scale model of an ideal high school); or a decision to make (Should the school board vote to build a new school?).It is reasonable to assume that what each child chooses to communicate to others is meaningful to her or him. In this way, the Project Approach can serve as a useful and meaningful complement to a more typical, systematic, or direct form of instruction.

Teachers' role

Project-based learning is only possible in classrooms where teachers support students by giving sufficient guidance and feedback. The teacher must thoroughly explain all tasks that are to be completed, provide detailed directions for how to develop the project, and circulate

within the classroom in order to answer questions and encourage student motivation. In order to create successful units focused on project-based learning, teachers must plan well and be flexible. In this approach to instruction, teachers often find themselves in the role of learner and peer with the students. Teachers can assess project-based learning with a combination of objective tests, checklists, and rubrics; however, these often only measure task completion. The inclusion of a reflective writing component provides for self-evaluation of student learning. Project-based learning is specifically designed to place the teacher in a facilitator role.

During project stage the teacher plays the role of a consultant, a facilitator or a co-learner and helps students gather ideas, define objectives, draw up the schedule and provide input for language skills. The teacher intervenes if students' direction not practical. The teacher offers suggestions to solve problems. He responds to the requests from the students. The teacher seeks to help the students to focus on relevant aspects. The teacher guides the students by asking questions and negotiating meanings with them. The teacher tries to frame the problems by referring to the findings of the problem. The teachers try to monitor the students' strategy for solving the problem. The teacher attempts to guide the students' negotiation of meaning. He collects and analyzes feedback from students. He revises and improves the project.

Jane L. David (2008) points out that yet, teachers can use the key ideas underlying project-based learning in some measure in any classroom. Using real-life problems to motivate students, challenging them to think deeply about meaningful content, and enabling them to work collaboratively are practices that yield benefits for all students (p. 1). Good teachers have always used projects as a supplement to their regular course of instruction. Any teacher, who has taken a group on a field trip, had students enter projects in different cultural and other fair, had a class garden, collected and measured the things found there, or any one of a thousand activities that involve students in studying and interacting with the real world around them, has conducted a project-based learning activity.

Michael M. Grant (2009) points out that the teachers should consider varying the length of projects to determine the appropriate duration for their students. It may also be helpful for teachers to modify the length of projects in order for students to experience different project durations (p. 16). If the teachers want to include in-depth investigations over an extended period of time, then additional research is needed for teachers in order to support the internal influences learners grapple with, such as motivations, self-management and evaluation of effort.

New challenges

Although project-based learning is cry of the modern day classroom activities, approaching it perfectly well creates challenges. So, here is a list of what are considered to be the main issues learners and teachers need to be aware of. Many of them as mentioned by Terry Freed-

man (2013:1) may be subsumed in the following points.

- a) Assessing accurately
- b) Monitoring progress
- c) Providing catch up opportunities
- d) Ensuring no time is wasted at the start of the lesson
- e) Ensuring quality learning
- f) Ensuring nobody waits too long for assistance
- g) Not minding an air of organised chaos

Project-based learning is not without its challenges. It's demanding of students -- and of teachers. Especially for teachers who have never experienced PBL before, projects require planning and management skills that may be unfamiliar. What's more, PBL puts teachers in the role of facilitator rather than classroom expert. Teachers may benefit from professional development to help them expand their classroom "tool kit" of teaching strategies. Just as it's essential that students buy in to PBL, teachers also need to feel empowered. Support from administrators, parents, and other community members can help teachers and students to overcome challenges and make the most of PBL opportunities.

Nichola Harmer and Alison Stokes (2014) point out that some of the predominant challenges of project-based learning raised in the literature. While these vary widely between discipline and approach, the two most significant identified challenges across the disciplines are that of group work, which is seen as a hugely important skill but holding the potential for conflict and free-riding by individuals, and difficulties experienced by staff and students in adapting to non-traditional teaching and learning roles (p. 21).

The studies suggest that project-based learning, when fully realized, can improve student learning. However, the research also underscores how difficult it is to implement project-based learning well. Together these findings suggest caution in embracing this practice unless the conditions for success are in place, including strong school support, access to well-developed projects, and a collaborative culture for teachers and students.

Students' role

Project-Based learning facilitates students in collaborative groups in problem-solving situations. Simson (2011) provides an explanation of PBL as a learning process where students work collaboratively to solve problems that are "authentic, curriculum-based, and often interdisciplinary" (p. 10). Project-based learning is, in essence, a structured social interactive experience where students work collaboratively often in pre-defined roles to solve a problem or accomplish a task. Some versions of PBL provide some learning issues for students in the form of objectives. In other versions of PBL, students are totally responsible for generating their learning needs.

Dewey (1938) explores the development of experience through interaction as a construct of social control (pp. 51-59). Students generally work in small, collaborative groups in the project-based learning model. They find sources, conduct research, and hold each other responsible for learning and the completion of tasks. Essentially, students must be "self-managers" in this approach to instruction. John W. Thomas (2000) points out that researchers can be interested in the differential appropriateness or effectiveness of PBL for different kinds of students (p. 20).

Results of project-based learning research are mixed. Some studies suggest that it is an engaging instructional approach, but numerous studies have also claimed that students are not motivated by this type of learning, and that it places a great amount of stress on teachers.

Conclusion

The brief study clearly identifies that PBL is the extreme demand in teaching and learning process. To respond to these complex demands, a growing number of teachers, schools, and learners have adopted project-based learning. In some cases, PBL is proving an essential ingredient in school redesign. Project-based learning offers promise as an instructional method that affords authentic learning tasks grounded in the personal interests of learners. Project-Based Learning movement is growing rapidly and has many strong supporters. The experience of thousands of teachers across all grade levels and subject areas, backed by research, confirms that PBL is an effective and enjoyable way to learn - and develop deeper learning competencies required for success in college, career, and civic life.

There is a timely need for expansion of some of the PBL researches with a systematic effort to build a knowledge base that will be accessible and useful to people in the field. There is direct and indirect evidence, both from students and teachers, that PBL is a more popular method of instruction than traditional methods. Additionally, students and teachers both believe that PBL is beneficial and effective as an instructional method. Research on PBL implementation is largely limited to research on project-based science administered by teachers with limited prior experience with PBL. It is clear that there is evidence that PBL is relatively challenging to plan and enact. Keeping the limitations of this research in mind, it is probably fair to say that most teachers will find aspects of PBL planning, management, or assessment fairly challenging and will benefit from a supportive context for PBL administration.

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