

WHAT WORKS?

Research into Practice

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How can professional project management strategies enhance project-based learning in schools?

Project-Based Learning: Drawing on Best Practices in Project Management

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Best practices in PBL ...

PBL empowers learners with a range of 21st century habits of mind from communication to critical thinking:

- answer a driving question
- collaborate on a project team
- co-plan learning and monitor team progress (with the support of a teacher)
- research the literature, build prototypes, conduct surveys, and engage in experiments
- create a final product and present it to a public audience

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Increasingly, teachers are exploring inquiry models of learning which help students develop higher-order thinking and communication skills so important in today's digitally interconnected world.¹ In this effort, they are finding that project-based learning (PBL) has much to offer as a holistic instructional strategy for engaging students in inquiry while instilling 21st century skills. The research, however, shows that teachers who implement PBL sometimes face challenges that can limit its effectiveness.² Often, these challenges focus less on subject content and more on the management of projects, especially in terms of time, scope, and quality.

To address this issue, it may be helpful to consider how best practices in PBL draw on the same well-tested principles employed in the business world by professional project managers³ to keep project schedules on track, mitigate project risks, and ensure project quality.⁴ Many of these strategies – which apply across the K–12 grades – can help teachers address various PBL implementation challenges, such as ensuring that projects are well planned, manageable in scope, and of sufficient depth.

Project-Based Learning: A Primer

PBL helps foster the 21st century habits of mind that students will need as adults. The Ontario Ministry of Education has identified PBL as a promising model for learning in their vision for the future of education.⁵ In support of 21st century learning, leading educational organizations, such as Edutopia (edutopia.org) and the Buck Institute

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Where education and business meet ...

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for Education (bie.org), have focused much attention on PBL best practices at both the elementary and secondary levels.

While there is no one agreed-upon definition of PBL, the following definition incorporates several of the key principles that define PBL in the literature: Project-based learning empowers learners to collaborate in teams, mentored by their teachers, as they research real-world questions, pose solutions to real-world problems, and design real-world products in a rigorous way.⁶

Depending on the instructional context, a project can be initiated by a teacher, proposed by students, or sponsored by an outside organization. A project topic is nearly always aligned with the curriculum, often interdisciplinary, and guided by a driving question – a carefully crafted, open-ended question that directly captures the focus of the project. For example, what are the factors that help a genre of music gain popularity with teenagers?

To answer their driving question, students collaborate on a project team. They co-plan their learning with the support of the teacher, research the literature, and, as appropriate, meet with adult experts, build prototypes, and conduct surveys and experiments, among other learning activities, leading to the creation of a final product that answers their driving question. The final product is presented to a public audience. The formative assessment of learning is ongoing. Students monitor and regularly report on their individual and project team’s progress, which allows teachers to track student achievement on an ongoing basis.

From a project management perspective, one of PBL’s strengths is the high degree to which key instructional design principles are enshrined in the professional development literature devoted to PBL. Foremost among these principles is the importance of ensuring that projects have sufficient subject depth to go beyond a surface-level study of a topic. Another key principle is the importance of connecting projects to the real world in order to ensure that student learning is authentic.

Project-Based Learning’s Strengths and Challenges

The strengths of PBL are well documented online.⁷ Students who are immersed in PBL develop 21st century habits of mind related to collaboration and communication, critical thinking, problem-solving, and self-direction. Content knowledge is retained longer, especially when students are invested in projects they find to be personally meaningful.

Less well understood are the challenges teachers sometimes face when implementing PBL, especially if they lack experience with inquiry-based teaching approaches. Common PBL challenges include a) managing the significant time investment required; b) ensuring that projects have sufficient subject depth; c) balancing the goal of student autonomy with the need for clear teacher direction; and d) keeping projects on track using formative assessment instruments.⁸

These challenges correspond directly to key principles in professional project management theory: a) time management; b) quality assurance; c) human-resource management; and d) ongoing monitoring. Given that PBL is a time-intensive instructional approach, time management is necessary to ensure that project teams do not have to rush a project to completion. Quality assurance is critical, as there can be a tendency for

poorly managed PBL projects to lack depth. This is especially true when attention is placed more on the presentation than on the critical inquiry associated with a project.⁹ PBL requires teachers to become project managers, playing facilitative roles that help student teams achieve their project goals. Ongoing formative assessment – a key concept in project management theory – is also essential. A project’s success is largely dependent on how well aligned assessment rubrics are to a shared, teacher-and-student understanding of the project’s requirements.¹⁰

The importance of the above principles is underscored by research that focuses on the perceptions of PBL teachers. For example, a study that explored the implementation of PBL in two California charter schools – one elementary and one secondary – identified many strengths.¹¹ However, the research also found that the lack of a “clear project plan, driving question, timeline, and assessment plan” (p. 107) placed projects at risk. Also, because PBL is more open-ended than traditional instructional strategies, teachers and students needed to be comfortable with a greater degree of ambiguity than they were typically used to. This research emphasizes the need for teachers to continually reflect on the management aspects of projects, as they revisit plans, adjust timelines, and scaffold students’ development of skills related to self-regulation.

Time-management emerged as a significant challenge in a study of technology-enhanced PBL at the secondary level.¹² Notably, this study also identified students’ lack of collaborative skills as contributing to group work challenges (e.g., discipline issues and inequity in the amount of effort students put into a project). Effective strategies for supporting collaboration are highlighted within the project management literature.

Implications for Classroom Practice: A Project Management Approach to Project-Based Learning

Many of the challenges teachers face when implementing PBL are also faced by professional project managers who oversee high-stakes projects in the business and not-for-profit sectors. Project management practices employed by these professionals, such as those discussed below, can be used to effectively mitigate the risks PBL commonly faces in schools:

- 1.** Foster a PBL-centric climate. PBL can only be effective in a classroom context in which there is respect between students and a strong sense of community. Students often need targeted instruction on how to effectively work in groups and draw on everyone’s talents in a collaborative way. You may wish, therefore, to employ human-resource and stakeholder management strategies that focus on the personnel aspects of projects. These might include investing in the project team’s training in terms of knowledge (e.g., subject content) and skills (e.g., group-work strategies) and staying in touch with individuals beyond the project team (e.g., principals, parents, and community partners) who hold influence over or are impacted by projects.
- 2.** Allow sufficient time for project planning. Advanced planning is key to professional project management.¹³ For school projects, key planning questions must be considered: What driving question will the project address? How will the project align with the curriculum? What are the specific requirements of the final product? What resources are needed? What will each team member’s specific role(s) be? What organizers (e.g., task-completion checklists and progress reports) will be used

Going for depth ...

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to track the team’s progress? As planning a project can be time consuming, particularly for student-initiated projects, you may wish to consider requiring a project team to prepare a proposal brief before drafting a full project proposal. And you may find it helpful to have the students pitch their proposal brief to you and to their peers, requesting feedback that will help strengthen the full project proposal. Don’t hesitate to require a project team to redraft a project plan that lacks sufficient detail or to roll back the scope of a project that is too ambitious.

3. Manage effectively the time and scope of a project. In professional project management, scope, time, and cost constitute what is known as the triple constraint.¹³ Changes to any one of these three constraining factors impacts one or both of the others. For example, if a project must be rushed to completion ahead of its originally planned end date (time), the feature set of the final product may need to be reduced (scope). In monitoring the progress of a school project, it is important to keep the triple-constraint principle firmly in mind, as it can help a project team make effective and realistic decisions.

In Sum

At its best, PBL provides teachers with the means for instilling in students a wide array of 21st century skills connected to deep and meaningful learning. At its worst, PBL can be perceived by both teachers and students as an inefficient use of time¹⁴ that does not sufficiently address the depth of subject knowledge needed by students. By effectively employing the same techniques that professional project managers use, teachers can circumvent the risks to PBL and help young people acquire the 21st century habits of mind that will be indispensable to them in their lives.

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