Project-Based Learning:
A Project Management Approach

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About the Author

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A certified project manager, David's project-based teaching innovations have been recognized nationally and internationally. He is a 2016 recipient of the *Brightspace Innovation Award in Teaching and Learning* from the Society for Teaching and Learning in Higher Education. He is a 2015 recipient of the *Professional Development Scholarship for Learning, Education and Development* from the Project Management Institute Educational Foundation.

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CHAPTER 1: INTRODUCTION

This handbook explores project-based learning from a project management perspective. Educators who adopt a project-based learning instructional approach need to be equally committed to best practices in student learning *and* best practices in the management of that learning. Both are important because project-based learning invests in students a greater degree of control over their learning than more traditional instructional methods. Add to this the fact that students work collaboratively on project teams, whose collective efforts may span several days, weeks, or even months, and it is clear that project-based learning is in many ways a high stakes instructional approach. It needs to be well-structured, well-planned, and well-managed in order to be successful.

Underlying the best practices associated with project-based learning are management strategies that find their roots in professional project management theory, a disciplinary area of study and practice that has evolved over the last half century. Many elements of project-based learning—most notably, the phases of project-based learning—are adapted from the same project management practices workplace professionals employ when carrying out complex and sometimes high stakes projects in the 'real world' outside of schools, colleges, and universities.

Paying close attention to the project management knowledge areas can help scaffold project-based learning. The professional project management knowledge areas[1] that I directly address with students in my teaching are:

- scope management (e.g., delineating the requirements for a project);
- human resource management (e.g., leading or working with a project team);
- stakeholder management (e.g., working with a project client or sponsor);
- communications management (e.g., keeping everyone informed about a project's progress);
- time management (e.g., managing time and/or creating schedules);
- risk management (e.g., planning for and managing the risks to a project);

[1] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

- quality management (e.g., ensuring that a project leads to quality outcomes).

The Project Management Standards

The internationally recognized standards for professional project management are maintained by the Project Management Institute (PMI) (pmi.org) which publishes the standards as *A Guide to the Project Management Body of Knowledge* (5th edition), commonly abbreviated as the PMBOK® Guide.

About the Handbook

This is the first edition of a handbook that is expected to expand in its project-based learning coverage with subsequent editions. The first edition focuses on the early phases of initiating and planning a student team-led project. Following an introduction to project-based learning (Chapter 2), the handbook explores how projects are initiated—by instructors, students, and project sponsors (Chapter 3)—leading to the writing of a mini project proposal. Chapter 4 describes the key components of a full project proposal. Chapter 5 discusses and links to the author's project-based learning resources for educational developers.

Updates to the handbook will be posted to:

eduproject.org/pbl_handbook/

CHAPTER 2: PROJECT-BASED LEARNING

In this chapter...

- introducing project-based learning
- defining project-based learning
- the seven project phases

Stop for a moment, close your eyes, and think back to your earliest memories of schooling. Now trace each year of your schooling, grade by grade, until your final year of high school or your first years of university. Focus especially on the academic studies you completed each year. What is it you remember most?

I imagine it is quite likely to be those educational experiences that were experiential, in which you played an active role, and were personally invested in the learning. Many of these experiences may well have been projects of some kind which you completed on your own or with others.

For my part, I remember clearly a project in Grade 4 centred around the study of the bass fish. In Grade 7 geography, I completed a project that focused on the threats to cities posed by the San Andreas fault line. Most memorable was a project in Grade 9 in which I conducted a taste test survey of the hamburgers served at local fast food restaurants. (It is 30 years later and my parents and I still talk about that project!) I still have all three of the reports I wrote for these projects. Occasionally, I will pull out one of these reports and travel down memory lane as I re-familiarize myself with my writing at age nine, twelve, and fourteen.

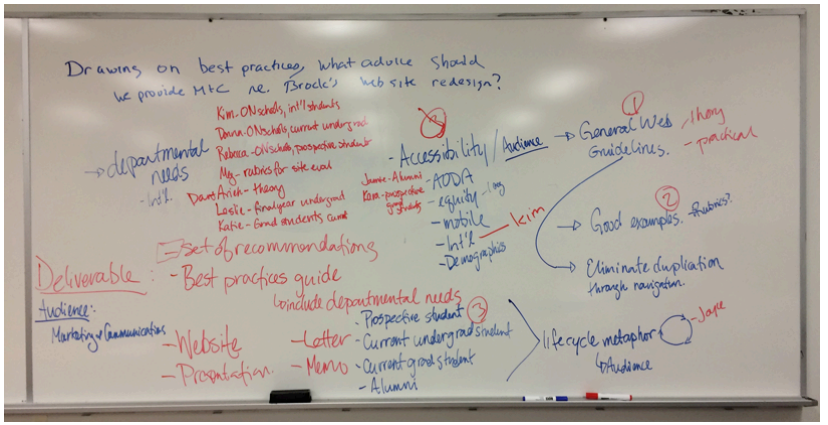
It was because I was personally invested as a learner in these projects that I have such vivid and fond memories of them. Indeed, it is a basic premise of project-based learning that to prepare young people for the opportunities and challenges of the 21st century—and to move them from being solely the consumers of existing knowledge to also being the co-creators of new knowledge—we need to find ways of engaging them in educational experiences that not only teach 21st century skills[2] (e.g., collaboration, critical thinking, and problem solving), but also instill a deep investment in learning that will be sustained throughout a student's life.

[2] See for example: Partnership for 21st Century Learning. (2016). *Framework for 21st Century Learning*. Washington, DC: Partnership for 21st Century Learning.

Introducing Project-Based Learning

Recently ranked in an Ontario, Canada instructor survey as the top 2016 educational trend in K-12 education[3], project-based learning (PBL) is a collaborative inquiry teaching approach in which students work as a team to plan and execute a curriculum-based project with real-world connections. At the *Equinox Summit: Learning 2030* conference hosted by the University of Waterloo in 2013, the invited international participants (including educators, students, and business leaders) envisioned a worldwide transformation in education, grounded in the principles of project-based learning.[4]

Depending on the instructional context, a project can be initiated by an instructor, proposed by a group of students, or sponsored by an outside organization. A project topic is often interdisciplinary and guided by a 'driving question' which is a carefully crafted and open-ended question that directly captures the focus of the project.



The whiteboard above captures a group of university students' early project planning, including the driving question (top left) and the decomposition of the project product (right).

To answer their driving question, a group of students collaborate on a project team. They co-plan their learning with the support of the instructor, research the literature and, as appropriate, meet with outside 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 beyond a project team's instructor and classroom peers. The formative assessment of learning is ongoing. Students monitor and regularly report on their individual and project team's progress which allows instructors to track student learning on an ongoing basis.

[3] Professionally Speaking. (2016). Trends to watch. *Professionally Speaking*. March., p. 15.
[4] Brooks, M. and Holmes, B. (2014). *Equinox Blueprint: Learning 2030*. Waterloo, ON: Waterloo Global Science Initiative.

Project-based Learning as an 'Instructional Umbrella'

Despite its strengths, project-based learning is not a panacea for every instructional challenge. As with any instructional strategy, project-based learning should be used judiciously by instructors, in combination with other instructional approaches, and in ways that leverage each instructional strategy's strengths. This said, project-based learning can effectively serve as an 'instructional umbrella' under which a wide range of instructional strategies are employed within a rich collaborative inquiry classroom culture.

Defining Project-Based Learning

The following definition incorporates several of the key principles that have come to define project-based learning in the literature:

Project-based learning empowers learners to collaborate in teams, mentored by their instructors, as they research real-world questions, pose solutions to real-world problems, and design real-world products in a rigorous way.

Let's break down the above definition into its component parts:

Empowers: Project-based learning shifts the locus of control over learning from instructor to student. Students are empowered to make meaningful choices related to the projects they undertake.

Learners: Project-based learning reconceptualizes 'students' as 'learners' who are naturally curious and inquisitive. Both qualities serve as driving motivators, especially for student-initiated projects.

To collaborate in teams: Project-based learning emphasizes collaboration and teamwork. Both skills are central to 21st century citizenship. (They are also highly sought after by employers.[5])

Mentored by their instructors: Project-based learning recasts instructors as project facilitators and supervisors who support the work of project teams, but who also set high standards for that project work. Instructors provide full classes and small groups of students with just-in-time instruction that helps students achieve their project goals.

As they research real-world questions: Project-based learning privileges learning which is connected to real-

[5] Davidson, P. (2014). What do employers want from Canadian higher education? *Universities Canada*. June 18. URL: http://www.univcan.ca/media-room/media-releases/what-do-employers-want-from-canadian-higher-education/

world contexts and which draws its influence from real-world questions that professionals also seek to answer. Projects help bridge the gulf between 'school' and what happens in the 'real world' outside of school.

Pose solutions to real-world problems: Some project teams aim to help solve a pressing social or scientific problem. Such projects are often driven by a problematic situation that the project team feels compelled to address.

And design real-world products: Some project teams aim to design and build a real-world product or prototype that fulfills a certain need. Such products may be physical or virtual entities.

In a rigorous way: Project topics are typically standards-based and closely tied to the curriculum. Accountability measures that help ensure high standards are built directly into the expectations for projects. Student teams regularly report their progress to the instructor and submit interim work for formative assessment.

The Project Management Institute Educational Foundation

The Project Management Institute Educational Foundation (pmief.org) is a charitable non-profit organization that publishes professional development resources for K-20 instructors who adopt a project-based learning approach. The foundation's resources help instructors and students model project management best practices through project-based learning.

Project Phases

In my scholarship of teaching and learning[6], seven project phases help scaffold project-based learning. They are: preparing, initiating, planning, executing, assessing, publishing, and closing. Notably, the executing and assessing phases are carried out in tandem with one another.

1. Preparing

Preparing the students for project-based learning through structured lessons, activities, and discussions.

The instructor sets up the instructional context in order to support project-based learning. This may include changes to the physical design of the classroom to promote collaborative inquiry (e.g., grouping tables and chairs).

[6] Hutchison, D. (2016). Scaffolding project-based learning through professional project management best practices. *Society for Teaching and Learning in Higher Education Conference*. London, ON: June 22.

The students are taught pre-requisite content knowledge and a set of project management skills which will help them achieve their project-based learning goals. For example:

- the stages of group development[7];
- effective communication strategies (e.g., active listening);
- assigning and documenting project team roles;
- drafting task lists, status reports, meeting agendas, and other organizers;
- creating schedules and Gantt (timeline) charts;
- facilitating meetings and recording decisions and action items;
- archival best practices (e.g., dating every document).

Through team-building exercises, the instructor and students jointly develop a shared understanding of and commitment to the values and expectations that will inform the students' project work (e.g., respecting everyone's ideas and endeavouring to complete assigned tasks on time).

[7] Tuckman, B. W. (2001). Developmental sequence in small groups. *Group Facilitation: A Research and Applications Journal*. No. 3. Spring. URL: http://openvce.net/sites/default/files/Tuckman1965DevelopmentalSequence.pdf

2. Initiating

Summarizing an idea for a project and securing the authorization to proceed.

As discussed in the next chapter, a project may be initiated by the instructor, by one or more students, or by an outside sponsor.

The initial members of the project team are determined. The scope of the project is defined.

A key goal during the initiating phase is to ensure that a project idea is feasible (e.g., not too ambitious or time consuming).

Particularly in the case of a student or sponsor-initiated project, a mini-proposal is ideally drafted and pitched to the instructor and/or a group of peers. Authorization by the instructor and/or peers for a project to proceed moves the project to the planning phase.

3. Planning

Detailing the plans for a project and securing stakeholder support.

A formal project proposal is drafted. As described in Chapter 4, the project proposal includes details (as warranted) related to: duration, audience, sponsor/client,

rationale, learning outcomes, deliverables, personnel, resources, budget, tasks, schedule, risks and constraints, assessment rubrics, and other components.

Approval of the project proposal moves the project to the executing phase. The project proposal becomes the project plan against which the progress of the project is measured.

The Project Management Process Groups

The project management standards[8] are organized around five process groups that are roughly equivalent to the phases of project-based learning described in this chapter:

- **Initiate**: Summarizing an idea for a project and securing the authorization to proceed;
- **Plan**: Detailing the plans for a project and securing stakeholder support;
- **Execute**: Carrying out a project;
- **Monitor and Control**: Managing the progress of a project in order to facilitate its success;
- **Close**: Bringing a project to a structured end.

[8] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

4. Executing and 5. Assessing

Carrying out a project. Managing the progress of a project in order to facilitate its success.

The project is carried out per the project plan.

It is an ongoing responsibility of project team members to track (i.e., document) and report (i.e., communicate) their progress to one another and the instructor. Regular updates to the project sponsor (if applicable) are also important.

The instructor plays a crucial role in monitoring the work of a project team. For example, instructors facilitate meetings to make modifications to the project plan where necessary and provide direct instruction to students that scaffold their knowledge and skill development in relation to the project.

The work of the project team and individual students are formatively assessed by the instructor throughout the executing and assessing phases using anecdotal and standards-based assessment approaches as appropriate.

The Triple-M Cycle

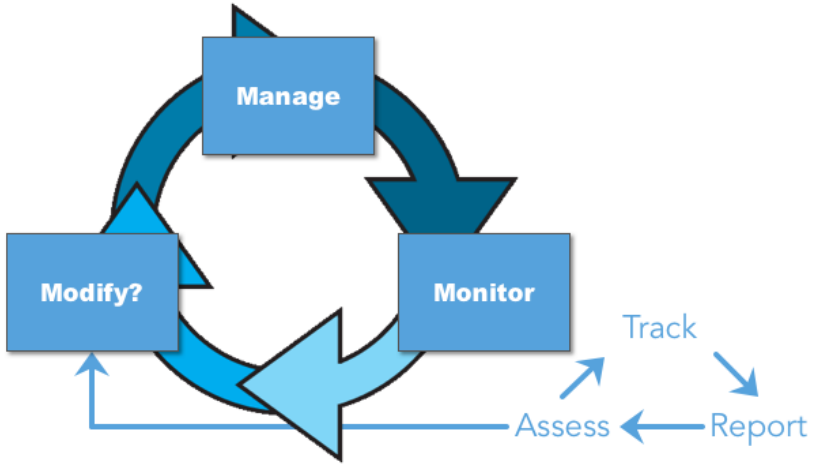
The research shows that project-based learning succeeds when a student team continuously monitors the progress of its

project, especially quality, risk, and time, modifying the project as warranted.[9]

Drawing on the project management standards, I have developed the Triple-M Cycle (see figure) which comprises the processes of managing, monitoring, and modifying. The monitoring sub-processes are:

1. **Tracking**: A *documentation* process. The project team, on a continuous basis, records its progress using a carefully selected toolset of text and graphic organizers.
2. **Reporting**: A *communications* process. Individual project team members convey their progress to one another and, equally importantly, to the instructor and project sponsor.
3. **Assessing**: An *evaluation* process. Judgements are formed about the project's progress, with particular reference to product quality and time management.

A project which falls out of alignment with the project plan will probably need to be modified in terms of its requirements with the project plan updated accordingly.



The Triple-M Cycle highlights the ongoing importance of tracking, reporting, and assessing projects as their progress is monitored against the project plan.

6. Publishing

Disseminating the final product(s) to others.

It is a core principle of project-based learning that the results of projects are publicly shared with others. The public sharing of project outcomes underscores the real-world focus of project-based learning. It also increases the stakes for students as they prepare their projects' final products for dissemination to others beyond the project team, instructor, and classmates.

[9] Harmer, N. and Stokes, A. (2014). *The Benefits and Challenges of Project-based Learning: A Review of the Literature*. Plymouth, UK: PedRIO/Plymouth University.

7. Closing

Bringing a project to a structured end.

If applicable, the project team meets with the project sponsor in order to invite their summative feedback and secure sign off on the final product.

The project assets—including the final product, interim deliverables, status reports, and other documents—are archived (and, where feasible, digitized).

The project is closed out with project team reflection activities and/or discussions which document best practices and lessons learned. Both are applied to future projects.

Each member of the project team is recognized for their contributions.

CHAPTER 3: THE PROJECT IMPETUS

In this chapter...

- initiating projects
- the rise of the problematic situation
- driving questions
- the mini proposal

The most compelling projects are born out of a deep student-driven need to answer a question, solve a pressing problem, or design a real-world product. The impetus for a project—the motivation for initiating a project—ideally lies, not in an uninspiring, externally imposed coursework requirement, but in an engaging learning experience that gives rise to a compelling project idea. An instructor helps establish the conditions for project-based learning by immersing students in a rich diversity of learning experiences that challenge their thinking, leading to new collaborative learning goals.

Project Initiation

At the discretion of the instructor, a project can be initiated by the instructor, students, or a potential project sponsor. Prior to being implemented, a student- or sponsor-initiated project nearly always goes through a proposal approval process (described in the next chapter). So often does an instructor-initiated project, especially one which provides students with the opportunity to refine and/or personalize the project.

Project Initiation and the Locus of Control

There is often (but not always) a direct relationship between who initiates a project and a project's locus of control going forward. For instructor-initiated projects, the locus of control likely 'leans' more towards the instructor rather than the students. The reverse is often the case for student-initiated projects, although the locus of control is always mediated by the expectations an instructor sets. A three way locus of control applies to projects that are initiated by external sponsors. Not surprisingly, sponsors expect to have a degree of influence over how a project unfolds.

Instructor-Initiated Projects

Instructor-initiated projects retain for the instructor a high degree of control over a project. This is ideal if a class of students are new to project-based learning or if the planned project needs to fit tightly into a larger unit of instruction.

Instructor-initiated projects have the following advantages. They can be:

- planned well in advance and as part of an instructor's instructional long-range goals;
- systematically aligned in advance to the curriculum standards and/or learning outcomes;
- refined and repeated year after year with different classes of students;
- carefully crafted to train students step-by-step in project-based learning best practices, leading students to later initiate their own projects.

Student-Initiated Projects

Student-initiated projects invest in students control over their own learning, including the content and skills on which they choose to focus. However, although students may have a degree of latitude in proposing the projects they collaboratively pursue, it is still likely to be a requirement that their topic choices align directly with the curriculum standards and/or learning outcomes. (Sometimes, as a capstone experience at the end of the academic year or course, students may be invited to propose a project which extends their learning beyond the prescribed curriculum, but only after the curriculum standards have been covered.)

Student-initiated projects have the following advantages. They:

- leverage students' curiosity, encouraging them to see learning as an intrinsically motivated endeavour;
- support metacognitive goals for learning as students make meaningful choices about what they need and/or wish to learn next;
- allow the student team to align its project topic to the specific interests and expertise of the project team's members;
- are likely to sustain student interest over the life of the project as it is the students themselves who have chosen the project topic.

Sponsor-Initiated Projects

Sponsor-initiated projects deepen the real-world authenticity of project-based learning by partnering project teams with external clients. Project teams pursuing a sponsored project need to be mindful, not only of the expectations of the instructor and project team, but also the expectations of the individual or organization sponsoring the project.

Sponsor-initiated projects have the following advantages. They:

- connect the project team with real-world organizations outside the learning institution;
- contribute to the community partnership mandates of school districts, colleges, and universities;
- fulfill a need and often result in products that have a meaningful impact;
- increase the stakes for students as the project team endeavours to meet the expectations of the sponsor.

Project-based Learning/Project Management Conceptual Model

In my scholarship of teaching, I have developed a conceptual model which visually depicts the intersection of project-based learning and project management theory for student-led projects that are conducted in partnership with external sponsors. Refer to Chapter 5 for more details.

The Rise of the Problematic Situation

The most compelling projects are often student or sponsor initiated and driven by the need (or invitation) to solve or address a social or scientific problem.

The philosopher John Dewey posited the notion of the rise of the problematic situation as a change in the social context of learning which triggers in students the need for new learning.[10] A problematic situation is marked by a disequilibrium between a phenomenon that occurs in a learner's perceptual field and the learner's normal response to the same or similar phenomena, which is no longer perceived by the learner to be adequate. This

[10] Dewey, J. (1916). *Democracy and Education: An Introduction to the Philosophy of Education.* New York: Macmillan.

disequilibrium is resolved through a process of inquiry in which the phenomenon that triggered the disequilibrium is studied and new understandings are formed.

Consider the example of a group of undergraduate students who conduct a local community study that reveals grave disparities in the upkeep and safety conditions of public playgrounds in wealthy as compared to impoverished areas of the city. The students are surprised and alarmed by what they have discovered, which is inconsistent with their previous assumption that all public playgrounds throughout the city receive the same levels of attention and care. The students are intent on initiating a project that highlights the disparities they have uncovered. They utilize geographic information system (GIS) software to map the disparities between the upkeep and safety conditions of playgrounds throughout the city. They then present their findings to city officials.

In the above scenario, the local community study has given rise to a problematic situation, a disequilibrium that needs to be resolved in the eyes of the students. The conditions of the public playgrounds in the impoverished areas of the city are incongruent with their moral belief that public playgrounds should be treated with the same care regardless of location. The students feel compelled to better understand the issue and highlight it to others which propels them to initiate a project with these goals.

Education for Social Change

As the above scenario exemplifies, the rise of the problematic situation is also a key concept in Dewey's social change theory. This is of particular relevance for project-based learning that focuses on education for social change.

Problematic situations that have their origins in social phenomena often arise within the context of the local community, the real-world social contexts in which students live and most likely identify with, perhaps through a story in the local media that piques their interest. However, problematic situations can also have scientific origins; for example, the need to explain a scientific phenomena under study or the need to develop a new technology to solve a pressing problem.

Whether they have social or scientific origins, problematic situations have the potential to drive student learning throughout the entire project lifecycle because students feel compelled to resolve the disequilibrium that challenges their thinking.

In this regard, instructors play a critical role in establishing the conditions for meaningful learning by

planning learning experiences for students that thrust their attention outwards, exposing them to new social and scientific learning contexts, some of which may challenge their thinking in ways that propel learning forwards and open up new possibilities for project-based learning.

From Inspiration to Driving Question

Projects often begin as 'big ideas' that are inspirational and compelling, but which are also too broad and unwieldy to be carried to successful fruition without a more specific focus. It is important that broad project ideas are honed early on into focused questions that drive student learning and inquiry. If a project topic is too broad or lacking in clarity, there is a very real risk that the project will not be successful, quite possibly for one or more of the following reasons:

- student learning may be broad, but it will not be deep;
- the project will go off on tangents, with no single project focus getting the attention it deserves;
- there may be insufficient time to complete the project.

If a broad project idea is honed into a focused topic, the limited scope of the topic will itself help organize the work of a project team, providing the team with clear direction.

Statement of Work

The educational developer resources summarized in Chapter 5 include an example statement of work, a to-the-point list of project requirements that was created by a university student project team.

Honing a broad project idea into a focused topic is an important first step, but a topic, in and of itself, does not motivate or drive learning. It simply limits the scope of a project's content focus. In order to propel a project forward in a purposeful way, it is helpful to craft a compelling question that needs answering.

One of the central principles of project-based learning is that meaningful student learning is guided by a *driving question* which is a carefully crafted and open-ended question that directly captures the goal of a project. For example:

- Are young people better off today than they were a generation ago?

- How can we improve the ecological health of our campus?
- How could the lessons of World War II be depicted in a historical drama we create?
- How have writing styles changed over time?
- What factors determine the growing popularity of new musical genres?
- What is the best design for a scale model that simulates the effects of wind on a suspension bridge?

> Activity Idea: Crafting Driving Questions 1

During the project planning phase, project teams can help one another to hone their driving questions. Pair up project teams and have them ask focused questions of one another that aim to help each team further refine its respective driving question.

Driving questions should be intriguing to students in terms of the topic areas they address and/or the research challenges they pose. Driving questions should directly connect to the curriculum standards and/or learning outcomes and, ideally, the topics students wish to learn more about. Where feasible, driving questions should be real-world based, so students can see the direct applicability of a driving question to the 'real world' outside of school, college, or university. Importantly, driving questions should be open-ended, so that a quick search of the Internet is unlikely to reveal a ready-made answer that precludes the need for students to think deeply about the driving question for themselves.

> Activity Idea: Crafting Driving Questions 2

To assess their skills writing driving questions, provide students with a short list of focused topic areas. Have each student craft a driving question for each topic area. Then ask the students to provide one another with feedback in pairs.

Qualities of Effective Driving Questions

Effective driving questions propel and sustain student learning and engagement throughout the full project lifecycle. Ideally, a driving question should demonstrate some (but probably not all) of the following qualities:

- **authentic**: it should draw from controversies or challenges that are central to a discipline or profession;

- **challenging**: it should challenge students to grow their learning and skills base;
- **clear**: it should avoid vagueness and a lack of clarity;
- **controversial**: it should provoke students to consider multiple perspectives;
- **empowering**: it should motivate students to see themselves as making a difference;
- **feasible**: it should not unduly overchallenge students or be so broad as to prove overwhelming;
- **local**: it should address local community contexts and issues;
- **motivating**: it should sustain student interest over the life of a project;
- **multi-disciplinary**: it should require students to draw on knowledge and skillsets from more than one subject area;
- **open-ended**: it should avoid simple "yes" or "no" answers which only require the recall of facts;
- **standards-based**: it should directly address the curriculum standards and/or learning outcomes that need to be covered;
- **timely**: it should address issues that are currently in the news.

With the above qualities in mind, consider how provocative and timely the following driving question would be in an environmental science course: *Are humans to blame for rapid environmental change or are the skeptics right?*

> Activity Idea: Crafting Driving Questions 3

Teach a directed lesson in which you introduce the characteristics of a well-honed driving question. Then provide the students with some examples of well-worded driving questions, intermixed with some poorly constructed driving questions. Can the students distinguish between the well-crafted and poorly constructed driving questions? Ask them to explain their reasoning.

The Mini Proposal

For instructor-initiated, student-initiated, or sponsor-initiated projects that require considerable planning, require a project team to first draft a mini proposal before moving on to develop a more extensive full project proposal.

The exercise of drafting a mini proposal can help focus a project team's discussions on the most salient elements of the project. A mini proposal helps both the project team and instructor determine, early on and before considerable planning time has been invested, whether or not a project idea is feasible and what the potential risks and constraints might be. With reference to the proposal sections discussed in the next chapter, a mini proposal might delineate:

- the project title;
- the supervising instructor;
- the subject area(s) and/or course(s);
- the audience;
- the sponsor or client (if applicable and known);
- a project summary;
- the driving question;
- how the project will align with the curriculum standards and/or learning outcomes;
- a preliminary list of final product(s);
- who is on the project team (which may be expanded as planning proceeds).

A mini proposal should have a limited word length (e.g., 500 words). To help scaffold the development of the mini proposal, consider providing a project team with a template which includes the above bullets as section headers.

Once a mini proposal has been submitted, it should be reviewed by the instructor who then provides feedback to the project team. A mini proposal may be approved by the instructor 'as is' or require changes and resubmission.

The Mini Proposal and the Project Charter

The mini proposal is roughly equivalent to the *project charter* as defined by the professional project management standards.[11] Both seek the authorization to begin planning the project.

Sometimes it may be necessary to decline approval of a student- or sponsor-initiated project outright; for example, if it is too ambitious, risky, or insufficiently aligned with the curriculum standards and/or learning outcomes.

[11] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

To minimize the need for this, address the critical importance of these factors in the preceding preparing phase, during which the overarching expectations for student initiated projects are established.

Instructor approval of the mini proposal provides the project team with the authorization to begin developing the formal project proposal which is discussed in the next chapter.

CHAPTER 4: THE PROJECT PROPOSAL

In this chapter...

- proposal components
- proposal approval
- proposal review panel

The project proposal is the formal planning document which articulates in writing a student team's plans for its project. The project proposal expands on the mini proposal, fleshing out its sections and adding new ones. Once a proposal is approved it becomes the formal project plan that guides the project team's work throughout the executing phase.

Typically, the full project team collaborates together on the development of a proposal. (Indeed, membership on a project team might well expand during the planning phase as the potential contributions peers could make, given their areas of interest or expertise, become clearer.) Full project team meetings are held, proposal drafts are written, and feedback from each member of the project team and instructor are sought which leads to an iterative redrafting the proposal until it is ready to be presented in finalized form to the instructor and, optionally, a panel of the students' peers.

Rolling Wave Planning

Not all projects are realistically fully planned out before the executing phase begins. *Rolling wave planning* is a professional project management strategy through which the iterative planning for a project continues throughout the executing phase.[12] Upcoming phases of the project are planned out in greater detail than the latter phases as the requirements of the upcoming phases are clearer.

Although rolling wave planning can be used effectively when carrying out lengthy or complex projects, the broad outlines of each phase of a project should still be articulated clearly by students during the planning phase in order to capture the full scope of the project, as well as its time and resource requirements.

This chapter describes the makeup of the proposal with reference to the individual sections that are typically found in most project proposals. The chapter is purposefully geared to college and university contexts.

[12] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

More streamlined proposal expectations should be set for students in elementary and high school.

Notably, not every proposal will feature all of the sections described below. Depending on the project, some sections may be entirely unnecessary or require only passing mention (e.g., a project that requires no formal agreements with external parties will have no contracts attached to it). On the other hand, certain proposals may benefit from extra attention being paid to some of the sections described below. Some proposals may also require entirely new sections that are geared to a project's unique focus.

Proposal Components

Title

What is the formal name the project will be known by?

The official title of a project should be noted at the beginning of the project proposal and in all subsequent documentation in order to clearly distinguish the project from other projects. A unique project name is important as team members may well be simultaneously contributing to multiple projects (across different courses). As well, the instructor needs a systematic way of designating each of the multiple projects he or she may be supervising.

The project title does not need to capture the full essence of a project. This is the purpose of a project's driving question. The project title should, however, be compelling, especially if it is to be used in public presentations about the project.

Duration

On what date is the executing phase of the project anticipated to begin? What is the anticipated completion date for the project?

Whereas the "Scheduling" section of the proposal provides considerable detail in terms of a project's timelines, the "Duration" section simply notes a project's start and end dates which can help capture how a project fits into a larger unit of instruction or long range learning plan.

Although the primary determinants of a project's end date are the total time the project is expected to require and how much time a student team expects to be able to devote to the project on an ongoing basis, the length of a project may be constrained by any number of external factors. Factors impacting the duration of a project may include, for example:

- an instructor imposed deadline;
- the approaching end of a course;

- the need to transition to a new unit of study;
- the need to deliver a final product by a certain deadline;
- the availability of team members or an outside expert;
- the timelines required by a project's sponsor.

Audience

Who is the intended audience for the project? Who will potentially benefit from the project? To whom will the final products be presented? If applicable, to what organization(s) should the results of the project be disseminated?

It is a basic principle of project-based learning that a project's final products should be presented to a public audience, beyond a project team's immediate classmates and the supervising instructor. A public audience raises the stakes for students and situates a project within a more authentic real-world context, a key goal of project-based learning.

The following table depicts an 'expanding horizons' view of the potential audiences for projects:

From Classmates to Public Audience		
Level	**Audience**	**Examples**
Level 1	Class	instructor; classmates
Level 2	School	another class of students; older or younger students; school wide presentation; school, college, or university personnel; student council; parent council
Level 3	Community	school district personnel; community residents; city council; regional or global organization; invited professionals; outside experts; project sponsor; publication
Level 4	Competition	science fair; robotics competition; film festival

At the narrowest level, a project is presented to a student team's classmates and the supervising instructor. Such a relatively 'low-risk' audience is appropriate for students who are new to project-based learning or

where training in project-based learning is one of the overriding goals for the project.

Stepping outside the immediate classroom, Level 2 focuses on school/college/university-based audiences; for example, two university classes that present the outcomes of their respective projects to one another. Projects that are presented to a school/college/university administration and/or a student council, perhaps with the aim of influencing school reforms, also fall into Level 2.

Level 3 focuses on local and/or global community-based audiences beyond school/college/university contexts. Typically, as part of the project plan, local community residents and/or outside experts are invited to attend a student team's final presentation. Alternatively, a project team's final product(s) might be formally published or presented to the local city council or another community level organization.

Finally, Level 4 focuses on projects that result in final products that are entered into competitions, such as science fairs or film festivals. While all projects should undergo a summative assessment, regardless of the audience, competition-based projects undergo a high stakes public assessment in competition with other entries.

Sponsor/Client

If applicable, what organization is sponsoring the project?

As discussed in the previous chapter, some projects may be sponsored by an outside organization or client who either commissions the project and/or works as a partner with the project team.

> Activity Idea: Conducting Pre-project Research

If a project team is experiencing difficulties articulating the specifics for a proposal component, it may be helpful to allocate some time for targeted pre-project research in a specific topic area where there is ambiguity. Pre-project research can include:

- **Literature Reviews**: For example, students research a topic area in order to apply what they have learned to the development of a stronger proposal;
- **Needs Analyses**: For example, students survey the potential audience (or customer base) for a final product in order to better articulate its features;
- **Feasibility Studies**: For example, students conduct a smaller project in order to determine whether the larger, more comprehensive project they plan to pursue will be feasible or not;

- **Prototyping**: For example, students create an early scaled-down iteration of a final product in order to better understand the appropriate design requirements for the final product.

Summary

In the space of a single paragraph, how might the project best be summarized?

Projects are typically multi-faceted. Nevertheless, it is important that student teams are able to summarize their projects to others, both orally and in writing, using as few words as possible when called upon to do so (including informally with family and friends).

The project summary should have a limited word length (e.g., 100 to 150 words) and appear near the beginning of the proposal.

Although brief, the summary should nevertheless be full-flavoured in addressing what is most salient and unique about a project.

Driving Question

What is the focused question that will drive student learning?

As discussed in the previous chapter, the driving question is the short single statement which articulates the compelling open ended question a project seeks to answer.

Rationale

What is the rationale for carrying out the project? What social or scientific problem does the project seek to address? What benefits will be derived from the project's product(s)?

In general, projects should only be pursued as long as there is a clear rationale for doing so. While the rationale for a project may be partially personal (e.g., "our project team wants to learn more about this topic"), the rationale should also ideally include a public dimension (e.g., "this project addresses a pressing problem in our community").

Success Criteria

In drafting a project proposal, a student team can optionally be asked to articulate the criteria for project success. However, the listed success criteria needs to be realistic in order to avoid feelings of disappointment down the road.

From a professional project management perspective[13], a project may be deemed successful if:

- the project is completed on budget and within the planned timeframe;
- the (original or modified) goals of the project plan have been achieved;
- the project products are assessed at a high level;
- each member of the project team is satisfied with his or her contributions to the project;
- if applicable, the sponsor is pleased with the final product.

Project sponsors are likely to define project success in terms of the final product(s). On the other hand, project teams and instructors are likely to hold a much broader view of project success, a view which encompasses the subtleties of completing a project from inception to closure.

In addition to (or in place of) success criteria, project teams can be asked to specify the conditions for project failure (e.g., "this project will have failed if...").

[13] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

Alignment with Curriculum Standards/Learning Outcomes

Which specific curriculum standards and/or learning outcomes will the project address?

It is a hallmark of project-based learning that projects are closely aligned with curriculum standards and/or learning outcomes. From their inception, projects should be initiated and proposed with the applicable curriculum standards and learning outcomes firmly in mind.

Ideally, projects will draw from the curriculum standards and/or learning outcomes from multiple subject areas. This is true, even for projects that focus on a specific topic. For example, at the elementary level, an urban planning project can readily draw on the curriculum standards for geography (e.g., mapping), literacy (e.g., comprehension), and numeracy (e.g., measurement).

Similarly, at the high school, college, and university levels, a project may span two or more courses that focus on different, albeit complementary, subject areas.

Locus of Control: Alignment with Standards

Instructor-centred: The instructor establishes directly how a project will align with the curriculum standards and/or learning outcomes.

Student-centred: Drawing from the curriculum standards and/or learning outcomes (or summaries thereof as provided by the instructor), the project team indicates how a project will directly align with the standards/outcomes. The instructor provides the project team with feedback and, where helpful, clarification about how to interpret the standards/outcomes.

Content and Skills

What are the specific content areas and skills that will be addressed by the project?

In contrast to the detailed statements which sometimes comprise curriculum standards and learning outcomes, this section of the proposal can be formatted as a concise bullet list of the specific content areas and skills that will be directly addressed by a project.

It may be helpful for a student team to group the content and skills a project will focus on into the following four categories:

- subject content;
- technical skills;
- habits of mind;
- project management skills.

Consider asking the project team to flag those content and skills areas in which it expects new learning to occur.

Deliverables

What final product(s) will be produced by the project? What interim deliverables will be drafted during the project's executing phase?

Deliverables is the formal project management term for the tangible product(s) that are produced by a project. Deliverables include the final products that are publicly presented during the publishing phase, but also the interim products that are produced throughout a project's lifecycle.

Final Deliverables

Referring back to the definition of project-based learning in Chapter 2, a project's final deliverable(s) should address the specific purpose(s) of the project, typically:

- to communicate the outcomes of research related to a real-world question;

- to pose solutions to a real-world problem;
- to produce a real-world product.

Examples of Final Deliverables

advertisement
artwork
bid
blueprint
book compilation
brochure
business plan
children's book
city plan
classroom redesign
conference presentation
cookbook
database
debate
delegation
demographic analysis
documentary film
environmental audit
essay
exhibition
historical archive
map
mobile app
mural
museum exhibit
musical composition
newscast
newspaper editorial
pamphlet
panel presentation
petition
photo essay
podcast
poster
product design
proposal for further action
prototype
public address
public service announcement
recipe
report
review
robotics competition
rules for a new sport
schematic
school garden
scientific discovery
scientific paper
screenplay/script
simulation
slideshow
software application
street artwork
technological innovation

theatrical production
timeline
video game
video production
website
wiki

Interim Deliverables

Interim deliverables include early iterations of the final deliverables, such as the early drafts of a final report or the early prototypes of a physical product.

Just as importantly, interim deliverables also include the various tracking and reporting documents that are produced and updated throughout the executing and assessing phases, such as calendars, checklists, Gantt (timeline) charts, logs, punch lists, self-reflections, and other text and graphic organizers, including revisions to the project plan itself.

Given the importance of the ongoing formative assessment of student learning, the interim deliverables produced during the lifecycle of a project (sometimes starting with the mini proposal) are in many ways just as important as the final deliverables.

Casting Students into Role

One of the strengths of project-based learning is that it provides students with meaningful opportunities to play out a wide range of real-world occupational roles. Essentially, project-based learning casts students into job roles, for example, as:

- **archivists**: (e.g., working with a local museum to preserve historical artifacts);
- **authors**: (e.g., writing a children's book);
- **automotive engineers**: (e.g., proposing the design for a new car);
- **city planners**: (e.g., pitching the development of a new sub-division);
- **community health educators**: (e.g., designing a presentation to educate local school children about an important health issue);
- **conservationists**: (e.g., proposing to city council the preservation of a local forested area);
- **construction engineers/model makers**: (e.g., designing a new physical product);
- **curators**: (e.g., organizing an art show of student work);

- **database administrators**: (e.g., developing an inventory database);
- **demographers**: (e.g., researching the long-term implications of population trends for the local community);
- **diplomats**: (e.g., organizing a mock United Nations simulation to which students in other countries are invited);
- **editors**: (e.g., launching a new student run newspaper);
- **inventors**: (e.g., developing a new product or improving an existing one);
- **investors**: (e.g., managing a hypothetical portfolio of stocks);
- **playwrights/screenwriters**: (e.g., collaborating on the writing of a play or movie script);
- **product safety engineers**: (e.g., testing a series of commercial products for safety issues);
- **public relations consultants**: (e.g., developing an advertising campaign for a local non-profit organization);
- **scientists**: (e.g., researching the water quality of a nearby river);
- **software developers**: (e.g., developing a new video game);
- **sports event managers**: (e.g., organizing a sporting event);
- **tourism coordinators**: (e.g., planning a cultural tour of the local community or an international destination);
- **web designers**: (e.g., designing a new website for a local business).

Not only does project-based learning cast students into roles, it can also provide a project team with meaningful opportunities to interact with outside experts who act as advisors to the project, providing the student team with professional input and guidance.

Personnel

Who are the student members of the project team? What are their respective roles? Which outside expert(s) will the project team approach to provide assistance with the project?

The project team is the main stakeholder body responsible for the overall success of a project. Comprised of content, skill, and tool experts, as well as a project manager, a project team sometimes works closely with one or more outside experts and often an outside organization or individual who serves as the project's sponsor.

On an ongoing basis, the project team tracks and reports its progress to a supervising instructor who in turn supports the student team as it works towards its project goals.

> Activity Idea: Team Role Descriptions

Consider requiring project teams to complete a team role description organizer as part of the planning process. For each project team role, ask the student team to provide:

- the name of the person who holds the role;
- to whom the role reports (if not the project team as a whole);
- the knowledge and skill requirements of the role (and whether skills training will be needed);
- the phase(s) of the project for which the role has responsibilities;
- a bulleted list of the specific project tasks which are assigned (or co-assigned) to the role.

Resources

What facilities, equipment, tools, and materials will be needed to complete the project? In what quantities will these resources be needed?

Rare is the project that has no resource requirements. Educational projects that aim to produce physical products invariably draw on consumable resources and even exclusively electronic projects require access to hardware and software tools. Although some resource requirements can be assumed (e.g., paper and writing utensils), this section of the project proposal should list all the required resources which are not staples of the typical classroom, including, where applicable, the quantities of each that will be required.

As a project team determines the resources that will be needed to complete a project, it should be mindful that access to certain equipment may be limited by scheduling or other constraints. Where applicable, this should be clearly noted in this section of the proposal and also taken into consideration when developing the project schedule.

Budget

How much will the project cost in terms of equipment, consumable resources, and other expenses?

Unless a project's resource requirements are cost free or will be provided to the students free of charge, a budget, detailing how the resources will be paid for, should be attached to the project proposal.

For some projects, it may be necessary for the project team to raise monies in order to pay for the needed resources. If applicable, the project team's revenue generation plans should also be detailed in the project proposal.

Tasks

What are the discrete units of work that need to be accomplished in order to successfully complete the project? Who will be responsible for each unit of work?

After the excitement of coming up with a compelling project idea has begun to fade and reality is quickly setting in, the hard work that lies ahead can often seem daunting to a project team. A project, considered as a whole, can be an overwhelming undertaking if it is not managed in a systematic way. Where do we start? Who should do what? Can we even accomplish everything we need to do in the time we have?

These and many other pressing questions are answered through the complementary processes of task delineation and task scheduling. *Task delineation* comprises the process of breaking down (or decomposing) a project into the discrete units of work that need to be accomplished. *Task scheduling* refers to the process of determining in what sequence and how much time to devote to each unit of work.

The Work Breakdown Structure

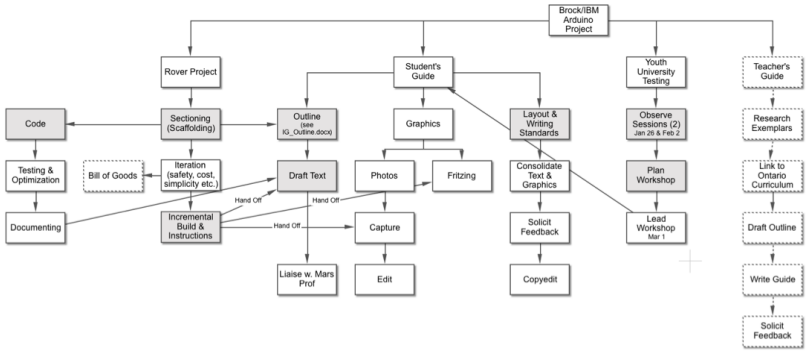
The process of identifying the discrete units of work is often complex. To assist, professional project managers routinely rely on a *work breakdown structure* (WBS) which is drafted early on during project planning. A WBS (see figure) is a hierarchal tree diagram which graphically atomizes a project into increasingly detailed units of work.[14]

Considered together, task delineation and task scheduling help a project team determine:

- the discrete series of tasks that need to be completed;
- how personnel (i.e., project team members) and resources (i.e., budget, facilities, equipment, tools, and materials) will be allocated across the numerous tasks that need to be completed;

[14] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

- the length of time that needs to be allotted for each task;
- the order in which tasks should be completed and whether certain tasks can be completed at the same time as other tasks;
- the project milestones and interim deliverables that demark key culminating points during a project's lifecycle.



The work breakdown structure above was created by a class of university students. This WBS exemplar can be downloaded from the EduProject.org website as noted in Chapter 5.

Project Milestones

The completion of a major series of tasks is often demarcated by a project milestone that helps a project team mark off its overall project progress. Depending on the context, a project milestone can entail, among other possibilities:

- the writing of a status report;
- the generation of a formal contract;
- a meeting of the full project team;
- a meeting with the project's sponsor;
- a request for feedback from an outside expert;
- an interim assessment by the instructor;
- the drafting of a preliminary version of the final product.

Task delineation is a critical undertaking which helps ensure that all of the work that needs to be completed is accounted for (i.e., budgeted, scheduled, and staffed).

The task lists that are drafted should be carefully reviewed by the project team prior to being finalized. Indeed, as a last step, it can often be helpful if one or more students who are external to the project review a project team's task lists, looking for gaps and ambiguously described tasks that would benefit from further clarification.

Below are three key questions a project team should ask itself as it reviews the task lists it has created for a project:

- Is the project sufficiently broken down into a detailed enough level?

- Have we covered all of the requirements of our final product(s)?
- Have personnel been assigned to each task?

As a project team reviews its task lists, it may increasingly become clear that some students are overloaded with work tasks, while other students are underutilized. If this is the case, it may be necessary to redistribute certain work tasks from one student to another in order to rebalance the workload between students.

> Activity Idea: Cost/Benefit Analyses

Conducting a cost/benefit analysis can be helpful in determining whether or not to broaden the scope of a project in a specific way.

In conducting a cost/benefit analysis, project teams weigh the pros and cons of a specific course of action in order to determine whether or not the course of action is worth pursuing.

For a decision a project team is uncertain about making, encourage the team to draw up a two-column table listing the anticipated costs and benefits. Reviewing these lists should help the project team reach the best decision.

Schedule

What is the schedule of work that will be followed? What project tasks need to be completed in advance of other project tasks? What project tasks can be completed at the same time? How much time will be devoted to each task?

The accurate and realistic scheduling of a project that takes into account all of the tasks that have been generated during the task delineation process can make or break a project. Many a project has needed to be abandoned or significantly scaled back because the schedule attached to the project plan was too ambitious, too rushed, or missing important details.

The process of scheduling determines the sequence for completing work tasks and how much time to devote to each unit of work. Essentially, the schedule organizes all of the tasks into a single or multi-layered timeline (also known as a *Gantt chart*) that provides precise details on the timing of each unit of work in the project, including most importantly:

- the date (and possibly time) the unit of work will be started;
- the date (and possibly time) the unit of work will be completed;

- the specific work periods that are devoted to the unit of work.

The steps below should ideally be followed in scheduling a project's tasks:

1. Sequence the tasks into the order in which they need to be completed. (This may include completing two or more tasks at the same time.)
2. Specify the amount of time each task can reasonably be expected to require (effort).
3. With reference to the start and end dates of the project and the effort required by the tasks that precede and follow each task, specify the start and end dates/times for each task (duration).
4. Carefully review the draft schedule, making changes where necessary.
5. Use graphic organizers to chart one or more visual representations of the finalized schedule (e.g., a calendar, timeline, and/or Gantt chart).

In building up the schedule for a project, the following considerations should be taken into account. The schedule should:

- be detailed. The timing of each unit of work should be precisely noted;
- allow for a degree of fluidity. Although a degree of fluidity may seem to contradict the previous point, it is nevertheless important that a schedule not be so fixed, immovable, and set in stone that it cannot withstand the need to be modestly adjusted at times;
- be realistic. Project teams need to avoid being overly ambitious in detailing what they believe can be accomplished during a specific time period. If anything, project teams should slightly overestimate (although not by a wide margin) the amount of time they expect each unit of work to require;
- include backup plans. The schedule should ideally designate unassigned work periods that can later be assigned to specific units of work that require more time;
- accommodate the need for later revisions. More than any other aspect of the project plan, student teams will likely need to modify schedules as projects move through the executing phase.

Scheduling Factors

A diverse range of factors can influence the scheduling of a project. Some will be unique to the project itself. Others, with

reference to the project management knowledge areas[15], will include:

- the size of the project team. The fewer members on a team, the more work tasks each member will need to be responsible for, likely lengthening the duration of the project. (Human Resource Management);
- the amount of time each project team member can devote to the project on an ongoing basis. (Time Management);
- the skill level of the project team members which will likely translate into how long specific units of work will require. (Human Resource Management);
- the amount of training that will be needed before work on a final product can begin. (Human Resource Management);
- the scope of the project, including its complexity and size. (Scope Management);
- the quality standards expected of a final product. Higher expectations for the quality of a final product will translate into more time needed to polish and tweak the final product. (Quality Management);
- the anticipated risks the project may face. This may necessitate padding the schedule with additional time as a contingency. (Risk Management).

[15] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

Approval and Reporting Requirements

How often will the project team report its progress to the instructor? At what points during the project, if any, will the project team require explicit approval from the instructor before moving on to the next stage?

A project's approval requirements can be noted in a separate section of the proposal, which has the advantage of explicitly highlighting the instructor's oversight role. However, these details should also be embedded into the "Schedule" section as flagged project approval milestones.

Risks and Constraints

What potential risks does the project face and how might these risks be mitigated? What constraints will the project need to work within?

For more information about helping students to manage the risks a project may face, please refer to the author's

Managing Risks & Constraints monograph at the EduProject.org website.[16]

Assessment Rubrics

What assessment rubrics will be used to assess the final and interim deliverables?

As with any assignment students complete in order to demonstrate their learning, the assessment requirements for the final and interim deliverables should be clear to all. Normally, an assessment rubric is drafted, either by the instructor or jointly by the instructor and project team, for each project deliverable, most notably the final product(s).

The assessment rubrics should be attached as appendices to the end of the project proposal. Each should be clearly labeled so it is clear to which deliverable it belongs.

In order to avoid the need to continuously reinvent rubrics with each new project, certain deliverables, which are standardized from project to project (e.g., team role descriptions), can draw on a standardized assessment rubric template that is project agnostic.

[16] Hutchison, D. (2015). *Managing Risks & Constraints*. St. Catharines, ON: EduProject.org.

Assessment Rubrics as Interim Deliverables

In certain projects, the drafting of an assessment rubric for a final or interim deliverable may be one of the goals of the project. In such cases, the assessment rubric is itself a project deliverable.

Contract Agreements

What formal contracts and/or agreements have been negotiated by the project team?

In order to successfully complete a project, it may be necessary for a student team to sign a formal contract with an outside provider. These should be referenced in the project proposal with the contracts themselves attached as appendices.

Since formal contracts legally bind students to specific commitments, they should be entered into cautiously and with the full knowledge and support of the instructor. Where feasible, contracts should be finalized, but left unsigned until after a project proposal has been formally approved. Alternatively, approval of the proposal should be a prerequisite condition for the agreement coming into effect.

Among other examples, contracts may include:

- project sponsor agreements;
- venue bookings;
- equipment rentals;
- product requisitions.

In the Internet age, not all of the formal commitments a project team makes may be officially signed. Some, for example, may be documented through a chain of emails. (In such instances, once an agreement via email has been reached, a member of the project team should fully document what has been agreed to in a final email that both parties then agree to abide by via email confirmation.)

Regardless of whether they are signed or unsigned, formal commitments should always be documented in writing in order to ensure there is absolute clarity and a record of documentation.

Approving the Project Proposal

As noted at the beginning of the chapter, the ongoing feedback of the instructor and, optionally, a panel of peers functions as a key formative assessment process during a project's planning phase. Ongoing feedback leads to the strengthening of the project proposal as it is further refined through multiple drafts.

Assessing the Proposal Draft

In reviewing a proposal draft, the instructor and/or proposal review panel may request changes, such as the following:

- a full redrafting of the proposal;
- the addition of one or more proposal sections;
- a scaling back of the scope of the project;
- a more finely-tuned driving question;
- a stronger rationale for the project;
- increased alignment with the curriculum standards and/or learning outcomes;
- more details about the final product(s);
- the addition of a new member to the project team;
- more details about how the project tasks will be delineated and/or assigned;
- a more realistic schedule and/or timeframe for completing the project;
- a greater number of checkpoints in terms of the approval and reporting requirements;
- further elaboration of contingency plans for identified risks;

- changes to the assessment rubrics for the interim and final deliverables;
- amendments to any as-of-yet unsigned contracts with external providers.

Locus of Control: Project Proposal Approval

Instructor-centred: The instructor is solely responsible for providing ongoing planning feedback to the project team and signing off on the final proposal. From a communications standpoint, there is a one-to-one dialectical relationship between the project team and the instructor as the project proposal is refined through multiple iterations in response to instructor feedback. Once the instructor is satisfied with a proposal draft, it is approved and work on the project can begin.

Student-centred: The instructor and a small group of students jointly provide the project team with proposal feedback. From a communications standpoint, the project team is welcome to solicit formative feedback from both the instructor and its peers. Striking a proposal review panel comprised of the instructor and students further strengthens the learner-centred nature of project-based learning by providing a meaningful role for students in the proposal review process.

The Proposal Review Panel

A written project proposal provides clear evidence on paper about a project team's plans for a project. However, it is often of great benefit to a project team if it also has the opportunity to orally pitch its project to the instructor and a panel of its peers.

Presenting its plans verbally to a panel can tighten a project team's understanding of the most salient aspects of the proposed project as it decides what to highlight during a five- to ten-minute pitch. A verbal pitch can also enhance students' oral literacy skills.

Proposal Review as Peer Review

The role of the proposal review panel roughly corresponds to the peer review process in academia, further strengthening the real-world authenticity of project-based learning.

A project pitch can be organized as a formal address to the full class or as a more personalized sit down meeting which includes the project team, instructor, and a subset of the students in the class. In either scenario, the project pitch should begin with a short presentation by one or more members of the project team, followed by an opportunity for the instructor and proposal review panel

to ask questions. Subsequent to this, the instructor and proposal review panel should meet privately in order to prepare their feedback for the project team. (The instructor may also wish to provide the project team with feedback independently of the student panel.)

The proposal review panel should ideally assess the merits of the project proposal and pitch with reference to the following and other relevant criteria:

- the project's overall likelihood for success;
- the specificity of the project proposal;
- well-defined roles for each team member;
- realistic scope and timeframes;
- if applicable, the originality of the project;
- if applicable, the contribution of the project in addressing a societal or scientific need.

A successful pitch culminates in the formal approval of the project proposal. Not surprisingly, this is often a celebratory event for a project team. The now finalized project proposal document becomes the project plan which is continuously referenced and, as warranted, modified, as work on the project proceeds through the executing and assessing phases of the project lifecycle.

CHAPTER 5: EDUCATIONAL DEVELOPER RESOURCES

In this chapter...

- EduProject.org
- project management course outline
- proposal brief template
- project management inventory
- project-based learning/project management conceptual model
- exemplars

This chapter introduces a variety of resources that I have developed and routinely use in my project-based learning teaching. All of the resources are available for download at the website for this handbook:

eduproject.org/pbl_handbook/

EduProject.org

EduProject is a knowledge mobilization portal for project-based learning. Coverage includes project-based learning at the elementary, secondary, and post-secondary levels. The EduProject.org website features:

- monographs contributed by project-based learning practitioners and researchers;
- links to project-based learning professional development resources;
- links to open access project-based learning research studies, cataloged by educational level;
- a carefully selected playlist of project-based learning videos with discussion questions;
- an Amazon™ powered project-based learning bookstore.

EduProject is supported by a Brock University Chancellor's Chair for Teaching Excellence grant.

Project Management Course Outline

Open to all second year students at Brock University (Ontario, Canada), IASC 2P01: Foundations of Project Management is a large enrolment online course that I developed and teach.

Rather than drawing on business case studies, as is generally the standard for project management courses, IASC 2P01 instead draws on students' own project experiences (as leaders or participants) across diverse contexts (e.g., school, work/volunteer, and/or leisure).

Below is the course description:

> IASC 2P01: Foundations of Project Management Professional strategies for planning and managing projects from inception to closure. Managing risks and constraints. Promoting collaboration and communication. Time management strategies for individuals and project teams. Solutions to common project management challenges. Introduction to project management software and organizers.

The course is closely aligned to seven of the ten project management knowledge areas that frame the readings, activities, and assignments in the course.[17] The course syllabus excerpt below shows how the knowledge areas are contextualized for students:

- scope management (e.g., delineating the requirements for a project);
- human resource management (e.g., leading or working with a project team);
- stakeholder management (e.g., working with a project client or sponsor);
- communications management (e.g., keeping everyone informed about a project's progress);
- time management (e.g., managing time and/or creating schedules);
- risk management (e.g., planning for and managing the risks to a project);
- quality management (e.g., ensuring that a project leads to quality outcomes).

Taking a page from project-based learning, the weekly topics for the course are expressed as driving questions

[17] Project Management Institute. (2013). *A Guide to the Project Management Body of Knowledge*. 5th edition. Newtown Square, PA: Project Management Institute.

that directly connect the learning for that week to each student's personal experiences and professional development as a project manager:

- Week 1: What are my project management learning goals?
- Week 2: What is project management and why is it important?
- Week 3: What are the components of a project plan?
- Week 4: What are some best practices when to comes to time management?
- Week 5: How can I build a realistic schedule for all the work that needs to be accomplished on a project?
- Week 6: What steps can I take to ensure a quality outcome for a project?
- Week 7: How can I use organizers to effectively manage a project's progress and quality?
- Week 8: How should I plan for the risks that may jeopardize a project?
- Week 9: What project management leadership qualities I should endeavour to develop?
- Week 10: What communication strategies should I employ in order to ensure everyone stays connected?
- Week 11: How can I build a project team that gets along and is productive?
- Week 12: How should I handle the most common project management challenges?

Proposal Brief Template

A proposal brief is the culminating assignment in the IASC 2P01: Foundations of Project Management course. Students are provided with step-by-step instructions (included in the course outline) plus a proposal brief template to complete.

Project Management Inventory

The project management inventory was developed for the IASC 2P01: Foundations of Project Management course as a way of helping students to identify their project management strengths and learning goals.

The inventory focuses on four of the project management standards:

- communications management;

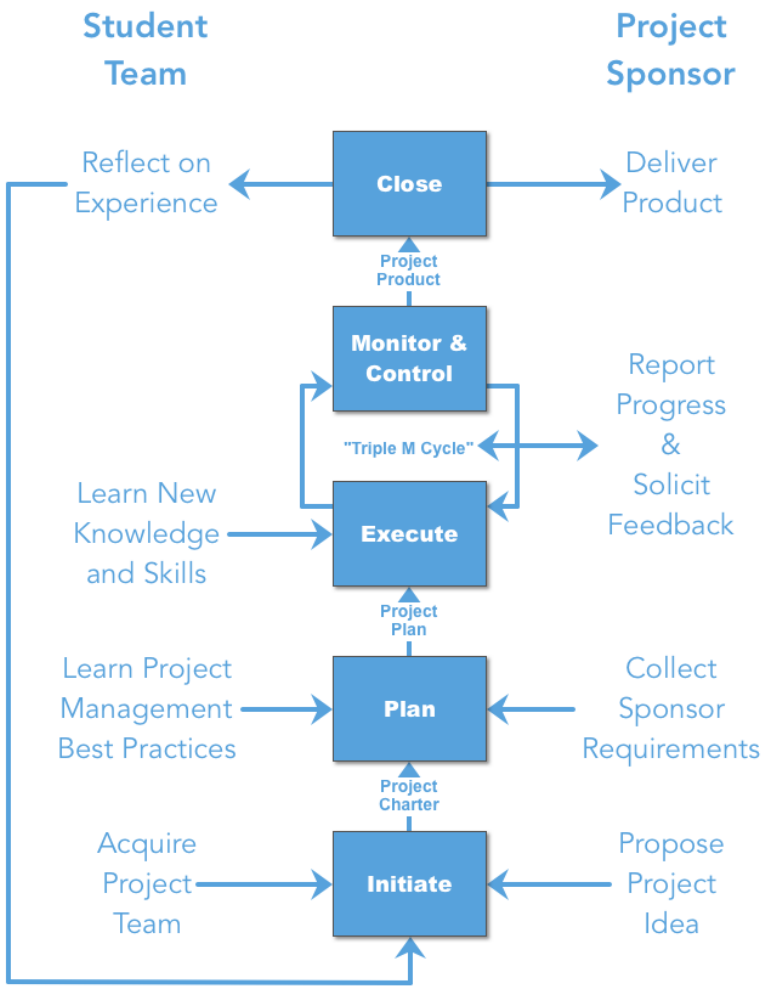
- human resource management;
- risk management;
- scope management.

PBL/PM Conceptual Model

The project-based learning/project management conceptual model I developed (see figure) scaffolds the projects students participate in as part of the Brock University Design Studio (BUDS) (brocku.ca/buds).

BUDS provides Brock students with course-based opportunities to practice and hone their knowledge and skills within a real-world, collaborative, project-based production studio context that incorporates a service-learning orientation.

Modeled on the principles of project-based learning, BUDS serves as the vehicle through which interdisciplinary teams of students—leveraging a diverse array of instructional design, digital tool, and subject content expertise—collaborate on interactive design projects sponsored by community partners.



The project-based learning/project management conceptual model shows the flow of interactions between the student team and the project sponsor throughout the project lifecycle.

As they plan a project, students learn key project management skills. As they move through the Triple-M Cycle (introduced in Chapter 2), students solicit the project sponsor's feedback. As they close a project, students apply lessons learned to new project experiences.

Exemplars

Students have given me permission to distribute the following examples of the different types of project management organizers they have developed to support their project work.

Statement of Work

A statement of work is a concise summary of the specific requirements for a project and its associated products. A statement of work should be as specific as possible in articulating the scope for what is and is not included in a project.

Work Breakdown Structure

As noted in Chapter 4, a work breakdown structure (WBS) is a hierarchal tree diagram which graphically atomizes a project into increasingly detailed units of work. A WBS can be used to help delineate the specific tasks that need to be carried out.