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**Thinking &
Learning**
Conference

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ROBIN FOGARTY

FRIDAY 18 MAY

Session 3

**PBL Inquiry Learning:
Creating Stakeholders and Scenarios**

MELBOURNE

DR ROBIN FOGARTY

Widely known as "the teacher's teacher", Robin Fogarty has taught at all levels from pre-school to university, and has trained educators throughout the world in curriculum, instruction and assessment strategies. She has also served as an administrator, and educational consultant in Europe, America, Asia and Australasia. With a doctorate in curriculum and human resource development, Robin is a widely recognised educational expert who has written and had published a proliferation of educational literature. Furthermore, some of her articles have appeared in Educational Leadership, Phi Delta Kappan, and the Journal of Staff Development.



Robin is known as the teachers' teacher. She brings a wealth of knowledge and passion to all endeavours, and is often complimented on her lively sense of humour and personable ways.

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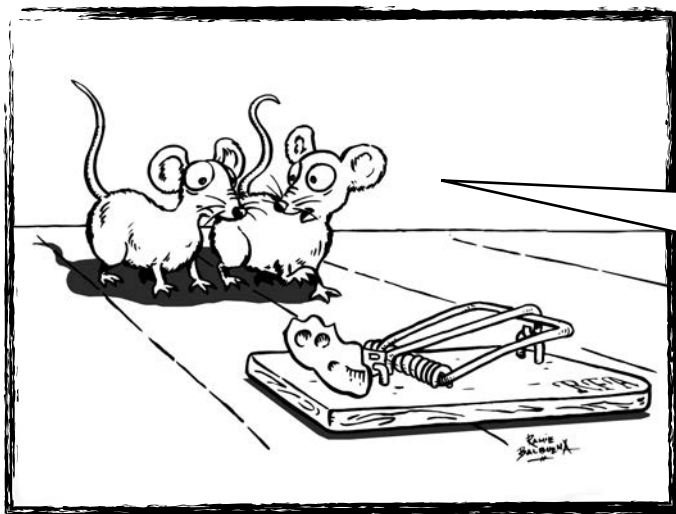
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Robin Fogarty

PBL Inquiry Learning:

Creating Stakeholders and Scenarios



OK, first we have to consider the possibility that this may be a trap.



Oliver Wendall Holmes
Adapted from the poem, At the Breakfast Table

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RFA

7 Step PBL Model

1-Develop Question

Big open-ended questions, the kind that keep you up at night. Asking questions with no easy answers, that cause students to ask more questions.

2-Stakeholder Scenario

"Who" is solving the problem impacts every decision within the process. All stakeholders, pursuing the same goal, with different POV's result in a variety of products.

3-Gather Resources

In the "Information Age" learning to skillfully and quickly navigate through the oceans of data on the web is a valuable skill involving critical thinking and decision making.

4-Organize Information

Making sense of all downloaded, copied, scanned and handwritten documents is no easy task. To stay out of the weeds focus on the solution and essential question.

5-Create Evidence

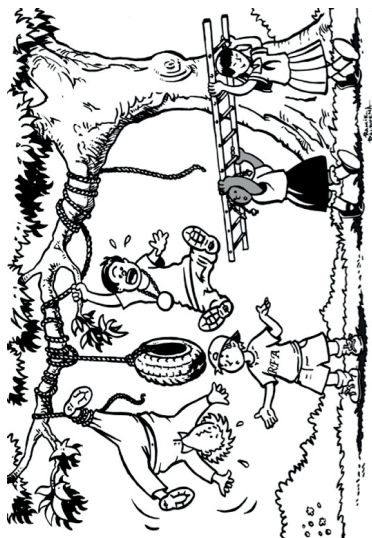
Creative synthesizing of the collected resources and turning them into a product that solves the problem, means making decisions on the fly with the clock ticking.

6-Present Findings

The Presentation of the Findings is as different from Creating Evidence as cooking a turkey is from serving a Thanksgiving dinner. One is the Product the other is the Presentation.

7-Assess Learning

If the goal is preparing students for the test of life then the first criteria is, "Was it on time?" Rubrics and checklists for the presentation.



"I don't know . . . this wasn't mentioned in the lesson plan"

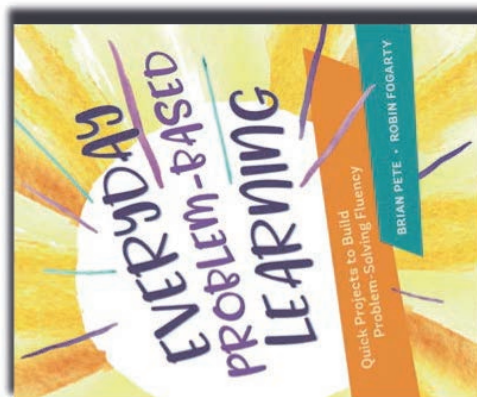
New Title from
Robin Fogarty & Brian Pete

*Unlocking Student Talent:
The New Science of
Developing Expertise*

The World is Looking for Problem-Solvers

<i>Top 10 Skills 2020</i>	vs.	<i>Top 10 Skills 2015</i>
1. Complex problem solving		1. Complex problem solving
2. Critical thinking		2. Coordinating with others
3. Creativity		3. People management
4. People management		4. Critical thinking
5. Coordinating with others		5. Negotiation
6. Emotional intelligence		6. Quality control
7. Judgment/decision making		7. Service orientation
8. Service orientation		8. Judgment/decision making
9. Negotiation		9. Active listening
10. Cognitive flexibility		10. Creativity

"For students to benefit from PBL curriculum attributes, such as critical thinking, problem solving, and time management, educators must view PBL as more than an end-of-the-semester project."



Robin Fogarty, PhD Brian M. Pete

Everyday PBL-

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45 Minute PBL Lesson

1-Develop Question

3-Gather Resources

6-Present Findings

2-Stakeholder Scenario

You are ... You will ...

(Your POV will be dependent on your role)

Roll the Dice



Record
the Number

You Will -
You will -
You Will -
You Will -
You Will -

4-Organize Information

5-Create Evidence

7-Assess Learning

*Reflect on the
Process*

Did You Know: You can do Problem-Based Inquiry, Everyday in a Single Class Period! Really? Daily, embedded, practical, “reach and repeat” iterations, practice, repetitions and rehearsals work. Period!

Gather Information

Figure 3.1 | Thinking Skill: Reason (LOGIC)

Reason	L ook at all the facts. O ffer connecting details. G ather explanations. Identify the most sensible reason. C onclude and communicate.
---------------	--

The thinking skill *reason* is featured in this chapter on gathering information because being able to reason, to think logically, is integral to making decisions about where to look for information, what to look for, and how to find it (see Figure 3.1). When teachers ask, “Why did you think that?” or “Why do you have confidence in this source that you cite?” it causes students to think on a much deeper level. In providing their reasoning, students must offer an explanation; this description of their thinking processes anchors the cognitive skill in a solid, more lasting way.

PBL in a Nutshell: A Bivariate Data Survey

In this lesson plan, students are to describe the possible association between two variables: how many years of drama a student had in his or her 12 years of schooling and how well (or poorly) that student reads one of the four poems listed below. The purpose of this exercise is to produce two data points, representing two variables that may show a correlation that is strong, weak, or nonexistent. It is a logical reasoning problem to find data to support a suspected correlation, such as many students in band or orchestra are also good in math. A survey of the data for both instances would be plotted to prove the correlation.

Poem 1

Peter Piper picked a peck of pickled peppers.
A peck of pickled peppers Peter Piper picked.
If Peter Piper picked a peck of pickled peppers,
Where's the peck of pickled peppers Peter Piper picked?

Poem 2

As I was in Arkansas I saw a saw that could out saw
any saw I ever saw saw. If you happen to be in Arkansas
and see a saw that can out saw the saw I saw saw
I'd like to see the saw you saw saw.

Poem 3

I wish to wish the wish you wish to wish,
but if you wish the wish the witch wishes,
I won't wish the wish you wish to wish.

Poem 4

Mary Mac's mother's making Mary Mac marry me.
My mother's making me marry Mary Mac.
Will I always be so merry when Mary's taking care of me?
Will I always be so merry when I marry Mary Mac?

CHAPTER 3 LESSON PLAN: CORRELATION STATION

NOTE: Allot approximately three minutes to each of the seven steps listed below, for a total lesson time of 21 minutes.

PBL in a Nutshell: A Bivariate Data Survey

Subjects: Math, Performing Arts, Language Arts

Standard:

Common Core State Standards, Mathematics, Statistics and Probability, Grade 8: CCSS.MATH.CONTENT.8.SP.A.4

Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

Lesson Objectives:

In this lesson students will

- Conduct a survey of fellow students, including recording data.
 - Graph data and make a judgment based on the data.
-

Assignment:

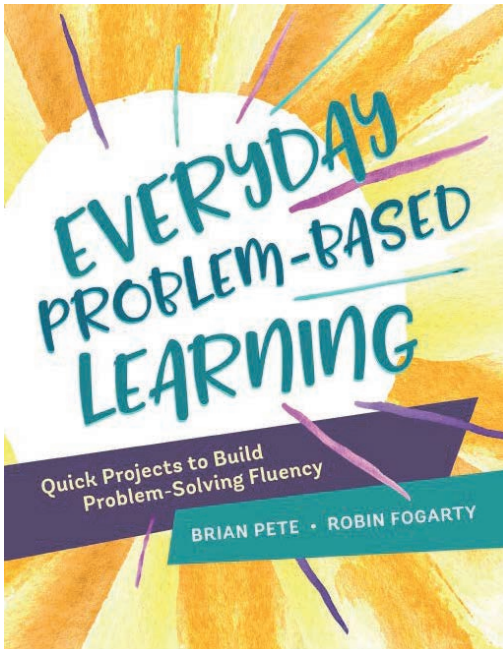
- Survey eight classmates by asking each one of them a question.
 - Time each of the eight classmates as they read a short poem.
 - Graph the two categorical variables.
 - Write a short conclusion of your research.
-

Content Review:

Interview questions, graphing two categorical variables

1. Develop question	Do the benefits of the arts last?
2. Launch scenario	<p>YOU ARE ONE OF THE FOLLOWING STAKEHOLDERS:</p> <ul style="list-style-type: none"> • A curriculum coordinator for a large school district • A state senator in charge of educational funding • A parent of a drama major • A student considering a career in the arts • A 5th grade teacher • A school principal <p>You will determine if there is a connection between students who took drama in school (elementary, middle, or high school) and their ability to “perform” extemporaneously by having them read one of four different poems. (Multiple poems are needed to reduce the chance that any one student will have an opportunity to read any poem more than two times.)</p> <p>YOU WILL ASK EIGHT DIFFERENT CLASSMATES THE FOLLOWING QUESTION: “How many years of drama did you have in your 12 years of schooling?”</p> <p>Then you will have the classmate read one of the four poems listed below, and you will time them as they read. They will read the poem through once, and you will record the time.</p> <p>You will then graph these two categorical variables: how many years of drama the student had and the time it took him or her to read the poem.</p> <p>You will write a conclusion from the point of view of the character you chose, based on the data collected, that addresses the question, do the benefits of the arts last?</p>
3. Gather information	<p>You will conduct interviews of eight classmates, asking the question, “How many years of drama did you have in your 12 years of schooling?” Then you will have the classmate read one of the four poems listed below, and you will time them as they read. They will read the poem through once, without starting over, and you will record the time it took them to complete the poem.</p> <p>Pay attention to the essential question as you gather information: Do the benefits of the arts last?</p> <p>Notice which classmate rises to the occasion of the impromptu performance.</p>
4. Organize information	<p>Record the data without using real names, for example, subject 1, subject 2, and so on.</p> <p>Graph the two categorical variables; refer to the chapter in the math book or to your own classroom notes.</p>

5. Create evidence	<p>Develop a graph with all eight data points.</p> <p>Write a summary of your findings with a recommendation for funding for the arts based on the data and given from the point of view of your character.</p>
6. Present findings	<p>Read your summary to another student.</p>
7. Assess learning	<p>Your product will be graded for</p> <ul style="list-style-type: none">• Grammar• Use of researched facts• Specific recognizable point of view



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Everyday Problem-based Learning

***Quick Projects to Build
Problem-Solving Fluency***

The Importance of Point of View

For a brief illustration of how points of view skew the “best or most desirable solution,” let’s look at a scenario for a drug prevention program. It demonstrates the differences inherent in taking on different points of view:

Scenario: Changing the legal drinking age

One state is facing a legal procedure calling for a decrease in the legal age for drinking alcohol from age 21 to age 18. The reason for the call for action is a result of increasing numbers of DUI (driving under the influence)

accidents as teens travel across the state border into a neighboring state where the drinking age is 18. Thus, the teens are traveling across state lines to legally purchase alcohol there.

As one of the stakeholders below, you will create a proposal for changing the drinking age in the one state involved in the legal action. Include three citations of research that support your request.

Stakeholder roles: What point of view is represented?

- Sheriff in state with legal age of 18 years
- State trooper in state with legal age of 21 years
- Teenager crossing the border
- Parent of that teen
- Justice of the peace in state with lower legal age
- Older brother of teen

With several of those stakeholder views mind, this is how their perspectives might influence their problem solving. The young teens going across state lines want information and facts favorable to lowering the age, and they will search for evidence to support their viewpoint. While, on the other hand, parents of the teens are skeptical of the wisdom of lowering the drinking age and will seek data and facts that affirm their point of view. Other stakeholders in official government roles—the county sheriff, the justice of the peace, and the state trooper—are all too familiar with the disturbing scene of teen accidents. Their point of view will certainly taint the findings they will present to persuade others against lowering the age. Every person has a view and may be swayed intentionally or unintentionally by that view.

Problem scenarios that have elements of a good narrative, exciting characters, interesting locations, and a daunting challenges to hook learners, ignite their interest, and motivate them to go further than they ever

thought possible. As Daniel Coyle points, out, “Beneath every big talent lies an ignition story” (2010). We acknowledge that an assignment from a teacher may not spark a flame that burns in the student until much later, when they become a world-class talent. Still, scenarios can engage students by targeting relevant concerns and sparking interests that will carry them into adulthood and future careers. One thing we *do* know about why role-play can work so well is because of the power of placing oneself in another’s shoes. According to instructional consultant Stephanie Nickerson (2007-08), “This provides opportunities for learning in both the affective domain where emotions and values are involved, as well as in the cognitive domain where experiences are analyzed.”

The Power of Narrative and Role-Play

About 155 million Americans play computer or video games regularly; of that number, 18 percent, or about 27 million, play role-playing games, “which typically rely on a highly developed story, setting, and a goal to achieve or a problem to solve” (Entertainment Software Association, 2016). Learning through role-play involves both decision-making and interpersonal communication skills. And because the scenarios are often scaffolded, with increasingly complex levels to attain, players are motivated to improve their performance and boost their levels of competence.

In addition to role play, the best problem scenarios use the power of narrative. The narrative form can bring a problem to life in our mind’s eye and “raise questions from multiple perspectives, not just our own, by using the point of view of characters who might otherwise be outside our personal interactions” (Champion, 2016, p. 6). Giving students the opportunity to act in an authentic scenario based on realistic narratives “supports their action-orientation, as well as their trial-and-error learning, or, in short, their learning through experience” (Geithner & Menzil, 2016, p. 229).

Not only is narrative formation a significant component of human cognition, but also the construction of narratives is a skill that anyone can practice and improve. Challenging students by having them harness the brain's hardwired capacity to make meaning through narrative is a reliable method to improve critical thinking and understanding by infusing data and facts with perspectives, emotions, and experiences. In addition, the use of problem scenarios or performance tasks not only shows what students know, but also, more clearly demonstrates what they're able to do (Pete & Fogarty, 2016). This approach produces visible examples of learning.

In our own practice, we often offer six stakeholder roles in the narrative, if only because we like students to roll the dice to generate a number and then reveal which stakeholder role corresponds to that number. This random assignment forces the student to adopt a given stakeholder role and proceed from there. No consideration is paid to what role the student would prefer because this may dilute the authenticity of the inquiry-based instructional model. Yet that is a decision that may be changed if there is strong opposition to it.

Problem Scenarios: From Simple to Complex

Problem scenarios or performance tasks can be simple or more complex, but they all present dilemmas for students to address. Usually there is merit in presenting varied roles for the scenario, but there are also times when students may address a PBL scenario on their own. In those cases, all students assume the same stakeholder role. This provides an opportunity for teachers to walk students through the problem solving when they are first teaching PBL.

Two Simple or Tame Problem Scenarios

Scenario 1

You are _____ (yourself, one of your siblings, your best friend, your pet).
You have \$200 to spend to redecorate your room.

You will submit (a decorating plan in writing, a list of materials and measurements, a budget, a comparative price chart, and a photo of your completed project or drawing of your projected redecorated room).

Scenario 2

You are 5th grader teachers, helping your student teams plan a fashion show for kindergartners. The show will demonstrate proper clothing for various weather conditions as the kindergartners learn about the weather elements.

You will have student teams select a weather element and complete the following: Summarize in a paragraph the results of an online search of the conditions that accompany that weather element., provide an illustration of appropriate clothing items for boys and girls, and have two student models on hand to model those clothing items in the fashion show.

Two More Complex or Wicked Problem Scenarios

Scenario 3

You are _____ (7th grader, a parent of a 7th grader, a business owner who depend on students to work in her business over summer break, a travel agent who books summer vacations, a student on the student council) who has been asked to report on the concept of year-round schools).

You will present your findings about year-round schooling, including both the positives and negatives; include five research summaries; evidence of community responses; and relevant conclusions. The “You will . . .” portion of the scenario delineates the academic tasks required. It is a way to scaffold the various components of the PBL as it unfolds. These tasks act as guide posts along the path to solving the problem.

Scenario 4

You are _____ (an 8th grader, an award-winning graffiti artist, an advocate for arts education, a real estate investor concerned with property values)

doing a civic unit with the Park District. You are using a service-learning approach, with a mandate from the mayor and the Village Board to deal with the prevalence of graffiti throughout the community.

You will investigate this concern by taking a field trip around the neighborhood. You will then present your findings to the Village Board. Your presentation will include a graffiti map of troublesome locations and a plan of action for providing a Graffiti Clean-Up Volunteer Service to the community Park District.

The magnetic effect these scenarios have on students of all ages is easy to see, and the influence on student motivation, initiative, and ownership is remarkable. Because the goal of inquiry-based instruction is student ownership of learning, students should, in time, develop their own problem scenarios around issues of interest or topics from the scope and sequence of the curriculum. Of course, this is a more advanced step that needs considerable practices to conquer.

Learning to Solve Problems

As children grow older, they rely less on others to solve their problems. Gradually, they become independent problem solvers who can get dressed, get to school, finish homework, and do their chores. Their problems become more complex, and they become aware of more and more challenges that are out of their control—for example, water pollution, poverty, and wars in many lands.

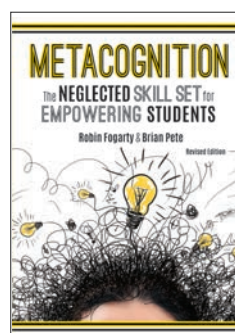
Learning to solve different types of problems will contribute to students' success in different domains. Because wicked problems have no definite formulation, because they're unique—because there's no template to follow—they're often associated with the arts, literature, and social sciences, such as psychology and anthropology. They're also the more prevalent problems students face in their everyday lives dealing with people and situations outside the classroom. Wicked problems have no true or false

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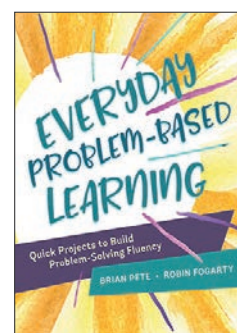
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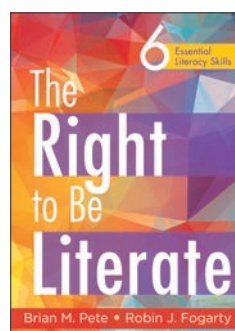
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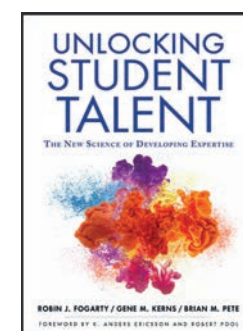
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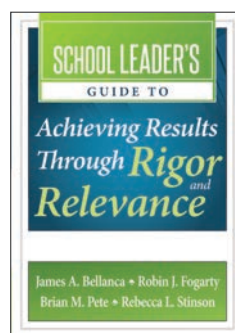
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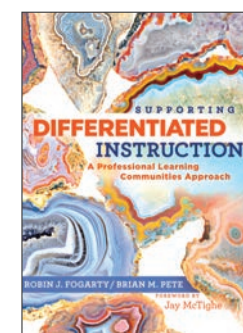
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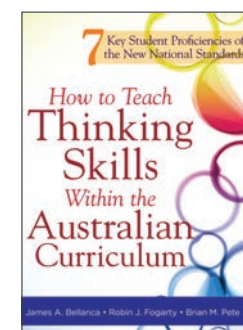
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