College and Career Readiness Through Project-Based Learning

Content provided by itsLearning
Meet Our Presenters

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College and Career Readiness through Project Based Learning

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Today’s Targets

Overview of how Project Based Learning (PBL) develops learners who are ready for college, career, and life.

Projects vs. PBL

Essential Elements of PBL

Importance of Voice and Choice

Example PBL Activities

Assessment and Reflection
What was the best experience YOU ever had in school?
8% completed College and Career Ready Curriculum

Source: The Education Trust

#Meandering2Grad
EdTrust.org/MeanderingTowardGraduation
# Top Ten Skills Employers Want

**Top 10 skills in 2015:**

1. Complex problem solving
2. Coordinating with others
3. People management
4. Critical thinking
5. Negotiation
6. Quality control
7. Service orientation
8. Judgement and decision making
9. Active listening
10. Creativity

**Top 10 skills in 2020:**

1. Complex problem solving
2. Critical thinking
3. Creativity
4. People management
5. Coordinating with others
6. Emotional intelligence
7. Judgement and decision making
8. Service orientation
9. Negotiation
10. Cognitive flexibility

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### Project vs Project Based Learning

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Based Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher-directed</td>
<td>Learner-directed</td>
</tr>
<tr>
<td>About the product</td>
<td>About the process</td>
</tr>
<tr>
<td>Directions may be done like last year</td>
<td>Based on driving questions from teacher and learners</td>
</tr>
<tr>
<td>Can be done alone</td>
<td>Requires collaboration</td>
</tr>
<tr>
<td>Project has same goal for all</td>
<td>Learners determine outcome</td>
</tr>
<tr>
<td>Products submitted to teacher</td>
<td>Products and process presented to authentic audience</td>
</tr>
<tr>
<td>Lacks real-world relevance</td>
<td>Based on real-world problems/challenges</td>
</tr>
</tbody>
</table>

What skilled learners do differently?

- Think on their own
- Ask more questions
- Are process-oriented
- Keep the big picture in mind
- Make mistakes work for them
- Look up answers
- Are good observers
- Cultivate curiosity
- Live with uncertainty
- Teach others
- Keep learning
- Share what they learned

Source: 25 Things Skilled Learners Do Differently by Saga Briggs
<table>
<thead>
<tr>
<th>Challenge and Confidence</th>
<th>Skills and Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner is familiar with the tools and has the skills to support the PBL activities. Learner is not confident with the learning strategies and is anxious being part of a group for PBL.</td>
<td>Learner has acquired the skills to choose and use the tools and strategies for the PBL activities. Learner is confident in the group and self-directs learning to challenge and solve problems.</td>
</tr>
<tr>
<td>Learner lacks the skills and is not familiar with the learning strategies and tools to support the PBL activities. Learner needs guidance and direct instruction.</td>
<td>Learner does not have the skills and learning strategies to support the PBL activities. Learner is confident and believes that he or she can learn by trying again and again.</td>
</tr>
</tbody>
</table>

Source: How to Personalize Learning by Bray & McClaskey

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Buck Institute Gold Standard PBL
Sustained Inquiry

A Driving Question….
- is broad and challenging yet age appropriate.
- allows learners to draw their own conclusions.
- relates to learners’ own lives, interests, or communities.
- is complex, but feasible to research in the time available.
- is open-ended and encourages more than only one answer.
- provides multiple approaches to research and solving problems.
- requires higher-level thinking skills such as synthesizing information.
- focuses on central issues that are often debated by experts in the field and are a frequent topic of media attention.
- can lead to a presentable call to action, plan, campaign, or proposal.

Source: adapted from How to Personalize Learning by Bray & McClaskey
<table>
<thead>
<tr>
<th>Quality</th>
<th>Question Does Not Meet Quality</th>
<th>Problem</th>
<th>Question Meets Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open/Closed</td>
<td>What is the weather like in India today?</td>
<td>Question has only one answer.</td>
<td>How has the climate in India affected the development of Indian culture?</td>
</tr>
<tr>
<td>Research and Reflection</td>
<td>For fourth grade: How many fingers do you have?</td>
<td>Question is not age-appropriate and does not require research or reflection.</td>
<td>For fourth grade: How would life be different if you had no fingers?</td>
</tr>
<tr>
<td>Relates to Learners’ Lives</td>
<td>What is a law?</td>
<td>Question does not relate basic skills and concepts to learners’ lives.</td>
<td>How do laws affect how we live?</td>
</tr>
</tbody>
</table>

Source: How to Personalize Learning by Bray & McClaskey
# PBL Methods and Strategies

<table>
<thead>
<tr>
<th>Competencies or Skills</th>
<th>Instructional Methods</th>
<th>Learning Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher refers to and demonstrates competencies and skills learners may acquire with PBL; e.g. critical-thinking, collaboration, research, voice, choice, self-management, etc.</td>
<td>Learners list and explain how they will meet competencies or skills based on the criteria in rubric. They provide evidence of learning by demonstrating mastery of competency or developed skill as part of the project.</td>
</tr>
<tr>
<td>Focus</td>
<td>Teacher guides the process for each group to choose a focus for their project based on the topic and group they chose.</td>
<td>Learners brainstorm ideas for the focus of project around the topic or theme they chose for their group.</td>
</tr>
</tbody>
</table>

Source: adapted from How to Personalize Learning by Bray & McClaskey
Meaningful and Relevant Focus

Questions to Guide Learning

- Is failure viewed as normal as a productive part of the learning process?
- Is learning spaced out over time rather than crammed into a short time period?
- Are distractions during learning normalized?
- Is learning playful and fun?

Source: Jackie Gerstein, Ed.D.
www.usergeneratededucation.wordpress.com
PBL Encourages Choice and Voice

Source: How to Personalize Learning by Bray & McClaskey
Pitch, Needs to Know, and Feedback

I like....

I wonder....

What I know

What questions I still have

My Interest

What I'm required to learn

How I demonstrate what I learned

What I want to learn
Project Based Learning gives Kindergarteners Agency

[Picture of students working together]

http://goo.gl/ub6WVA

Paula Ford @prford5, Kindergarten teacher at Manuel De Vargas Elementary School in Cupertino, CA
www.personalizelearning.com/2016/03/project-based-learning-gives.html

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Reflection Makes Learning Visible

1. Notice Learning
2. Talk about Learning
3. Reflect on Learning
4. Make Learning Object of Learning


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5 W’s of Personalized Learning® eCourse – Fall Session starts October 5th

Join us in the next
#plearnchat on Sept. 26th at 7pm ET  
Topic: Personal Learning Plans

#plearnchat @itslearningUSA
Our School Story Doesn’t Have to Be Everybody’s School Story

Joshua Giebel
Mathematics Facilitator at Columbus Signature Academy New Tech High School
7+ years of teaching in a PBL environment
PBL Teacher Trainer
@askgiebs
Meet My School

Columbus Signature Academy

A Revolutionary Pathway to Education
K-12 PBL Pathway started in 2008
Nation-wide Demonstration Site for PBL practices and implementation

Hosts a regional PBL professional development conference annually
Award winning projects
(Don’t) Lean on Me Project

Integrated Geometry & Introduction to Engineering/Design course
- ~45 students per class
- 2 certified teachers (Math & Engineering)

Content Covered
- Geometry
  - Properties of arcs, circles, tangents (LOOK UP STANDARDS)
- Engineering
  - Reverse Engineering
  - AutoCAD prototyping
itslearning is used to facilitate project based learning.

The Beginning - Project Launch

Entry Video

The Problem
In our school we have a constant problem of the seats on the chairs breaking off. This is caused by a number of reasons, but our hope is that your class can come up with a design that can help fix the problem. The main reason is that such a problem is because it can be a hassle to sit in a chair that has one of these foot pads missing. If you have ever sat in a chair without one you know what we mean. We are asking you analyze the design of the existing foot pads for our chairs and reverse engineer a better foot pad. Since the chair legs are round you will need to gain knowledge of circles to ensure that your design is a perfect fit. We know that one solution is to hold students accountable for working back in their chairs, however, we are looking for a detailed solution to the already numerous broken chairs.

Always, when developing a solution to a problem we expect you to document your progress through the Design Process in your engineering notebooks. Be sure to include all relevant decisions and diagrams in your notebooks. Additionally, you may want to include any related content vocabulary and procedural skills that help you develop your solution.

We will expect each group to deliver a formal presentation of their proposed solution in a few weeks. We look forward to seeing what you come up with.

Project Excitement
How excited are you for this project?
- Can’t Wait! Sooooooooo excited!
- This seems pretty cool.
- Well it is interesting that’s for sure.
- Meh.
- I’m actually dreading this.

Learning Objectives and Standards

Geometry Standards:

- G.CO.1: Draw, identify, and use relationships among the following: radius of a circle, diameter of a circle, secant, tangent, and congruent circular arcs.
- G.CO.5: Identify and describe relationships among inscribed angles, radii, and chords, including the following: the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter of a circle are right angles; the radius is perpendicular to a tangent where the radius intersects the circle.
- G.CO.8: Solve real-world and other mathematical problems that involve finding the measure of inscribed or central angles, the radius of a circle, and the measure of an arc, and the arc length of a circle.
- G.GPE.2: Construct a tangent line to a circle through a point outside the circle, and construct a secant line from a point outside a circle to the circle, justify the process used for each construction.

- G.GPE.3: Construct a tangent line to a circle through a point outside the circle, and construct a secant line from a point outside a circle to the circle, justify the process used for each construction.
A-ha Moment #1

The Know & Need to Know Process is one of the most important parts of successful PBL

<table>
<thead>
<tr>
<th>Student ownership</th>
<th>Increased engagement</th>
<th>Deeper thinking</th>
<th>Every lesson should be tied to a NTK</th>
</tr>
</thead>
</table>

The Middle – Scaffolding & Benchmarking

- Students engaged in workshops & scaffolding to find the center of the circle
  - Dynamic Geometry Software Investigations
  - Constructions

- Students generated potential ideas for replacement footpads

- Students demonstrated mastery of content standards

- Students used Discussion Boards to share ideas and collaborate
Develop a Solution: Conjecture Used

- Angle inscribed in a semicircle are all 90 degrees angles.

Every angle in a semicircle is a right angle.
### A-ha Moment #2

<table>
<thead>
<tr>
<th>Collaboration is critical to learning, learning doesn’t happen in isolation.</th>
<th>Encourage productive conversation</th>
<th>Encourage multiple solutions</th>
<th>Provide time for students to intentionally share their work</th>
</tr>
</thead>
</table>

PBL is noisy – get used to it!
The End – Final Products

Students used Autodesk Inventor to develop a prototype.

Footpads were 3D printed.

Students presented solution ideas to a panel consisting of engineers & representatives from the company that sold us our chairs.
### A-ha Moment #3

Get kids in front of adults – let them know what it is like to present in a real work setting.

| Learning to process and accept critical feedback is critical after high school | Buy-in decreases significantly when authenticity decreases |
itslearning supports PBL

George Scotti
Director of Marketing
itslearning
Some ways itslearning supports PBL

- Project content, lessons, resources and assessments are aligned to both content and skills based standards/learning objectives.

- Student can problem solve on their own via the searchable library, collaborate with teachers and/or students via messaging and communities.

- Multiple tools allow students to engage, respond and work through assignments, tasks and problems.

- Students can participate in pre-lesson surveys, polls and discussion boards to communicate and collaborate on how they work and what they create.

- Students have the ability to inform their peers and community on their passions and progress with tools such as communities, blogs and ePortfolios.

- The interactive assignment rubrics allow teachers to give each student concrete, actionable feedback on how well they have mastered each skill or criteria. Student can use this feedback to edit and resubmit until mastery is reached, fostering an academic growth mindset.

- Students can express their project in the way they choose, including audio, video, or text, via their ePortfolio that can be shared externally to a focused audience.
Thank you.

For more information visit our website.

Watch for our PBL:
- eBook
- Quiz
- LMS Decision Guide

www.itslearning.net