Connecting the original design work of students to opportunities and the national STEM conversation.

Free, open and secure for use by all students, teachers, and mentors - everywhere.

Missouri PLTW
Project Lead The Way
Fall State Conference
Leaders in STEM Education 2015
“I now have a former student who is a freshman in college, and he went to a job fair. Job fairs in college are normally for seniors, one might think. The freshman just went to see what it was about. He started talking with one company, and right there on the spot, with permission of course, he jumped on to this company rep’s laptop and showed him the work he had still preserved on the portal from his high school senior year.

This company official was so impressed that he offered my former student an internship for this coming summer. You can’t script stuff like that, but you can offer it as an example that this is the power of the Innovation Portal.”

Barry Witte, Senior Capstone / Engineering Design and Development Instructor - South Colonie High School. Albany, NY
ILLINOIS INNOVATION TALENT PILOT PROJECT

Engineering Projects in Community Service-Learning (started at Purdue University)

30 Schools – 10 Industry Partners

9 Schools – San Diego County

20 universities – 57 High Schools

30 Schools – 10 Industry Partners

TSA

ILLINOIS INNOVATION TALENT PILOT PROJECT

SkillsUSA

20 universities – 57 High Schools

High School Invention Grants

LEMESON-MIT

InvenTeams

PBLNetwork Collaborative Inquiry in Action

30 Schools – 10 Industry Partners

EPICS/HIGH

Engineering Projects in Community Service-Learning (started at Purdue University)

Hundreds of capstone instructors across the country

(1,980 Capstone Teachers - Engineering and BioMed)

EPICS/HIGH

Engineering byDesign™

Hundred of capstone instructors across the country

Inventor’s Day. With their idea now protected, it was time to survey more potential users and obtain their feedback.

High School Invention Grants

InvenTeams

PBLNetwork Collaborative Inquiry in Action

30 Schools – 10 Industry Partners

EPICS/HIGH

Engineering Projects in Community Service-Learning (started at Purdue University)

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Inventor’s Day. With their idea now protected, it was time to survey more potential users and obtain their feedback.
Without a systematic process for reviewing original student design work there is no way to incorporate the value of the work into the algorithm of college admissions or any other recognition process. Without a standardized assessment tool to organize and evaluate any submitted work there can be no systematic process.

Liz Kisenwether - Penn State
Dr. David Rethwisch - University of Iowa
Bill Leonard - Rochester Institute of Technology
Dr. Karen High - Oklahoma State University
Dr. Ken Reid - Ohio Northern University
Dr. Kurt Helgeson - St. Cloud State University
Dr. Mac Banks - Worcester Polytechnic Institute
And many others.

“Hands down, a student with decent grades and a solid experience in a capstone design course would be at the top of my list for admission ever….”

Dr. Paul Strykowski - Associate Dean for Undergraduate Programs - University of Minnesota

AP Studio Art is not based on a written examination; instead, students submit portfolios for evaluation at the end of the school year.
Engineering Design Portfolio
Grading Rubric and Process Meeting

March 30th and 31st, 2010
University of Maryland – College Park
Engineering Design Process Portfolio: Element Titles

Component I: Identifying, Articulating, and Justifying a Problem

Element A: Presentation and Justification of the problem
Element B: Documentation and analysis of past and current solution attempts
Element C: Presentation and justification of solution design requirements
Element D: Design concept generation, analysis, and selection

Component II: Generating an Original Solution

Element E: Application of STEM principles and practices
Element F: Consideration of Design Viability
Element G: Construction of a testable prototype

Component III: Testing and Analysis

Element H: Prototype testing and data collection plan
Element I: Testing, data collection and analysis
Element J: Documentation of external evaluation

Component IV: Reflecting and Formulating Recommendations

Element K: Reflection on the design project
Element L: Presentation of designer’s recommendations

Component V:

Element M: Presentation of the Project
Element N: Writing like an engineer
A “5” from the Rubric

The problem is **clearly and objectively identified and defined with considerable depth**, and it is well elaborated with specific detail; the justification of the problem highlights the concerns of many primary stakeholders and is based on comprehensive, **timely, and consistently credible sources**: it offers consistently objective detail from which multiple measurable design requirements can be determined.”

Reflective Question(s)

- What exactly is the problem? How do we show that the problem has merit to pursue?
- How do I phrase it as an **objective “cause – effect” problem statement**?
- What is the background, context or setting of the problem?
A “5” from the Rubric

“**Documentation of plausible prior attempts to solve the problem and/or related problems** is drawn from a wide array of clearly identified and consistently **credible sources**; the **analysis of past and current attempts** to solve the problem—including both strengths and shortcomings—is consistently clear, detailed, and supported by relevant data.”

**Reflective Question(s)**

- What are all of the methods, products, or actions that are being used or have been developed to try and solve this problem and **exactly why doesn’t each of them actually solve the problem?**

- How do we prove to others that we have done an extensive search for possible current solution attempts?

- Who has helped us identify and state the shortcomings of the solutions attempts found and why should anyone believe them?
How to connect the pieces

The Rubric

Student Work

60,000 Foot Goals

1 - Create a web-based, secure (IP issues) and standardized process for building and posting student portfolios of original design work

2 – Create access to multiple opportunities for recognition

3 – Create a means of identifying, extracting, documenting and distributing noteworthy Innovation Portal events for all stakeholders
“So much more than a classroom portfolio and assessment tool…”

University led research and refinement of the EDPPSR rubric (Engineering Design Process)

- Impact, Scale, Engagement, Sustainability
- Used in thousands of K-12 and Post-Secondary classrooms
- Interest and student recognition from the public and private sector

“So much more than a classroom portfolio and assessment tool…”
2015 Illinois Engineering Design Competition

Finalist Presentations and Project Expo - May 27th, 2015

Hermann Hall - Illinois Institute of Technology

28 Project Submissions from across the state – 11 Judges – 6 finalists – 13 Expo Displays – 6 on Site Expo Awards

Aqua Brace
$2,500 Abbott Award
Jordan Williams, Alyssa Zillmer, Connor Griffin
Bartlett High School – Bartlett, IL
Instructor: Janine Stevens

Solving the Issue of Earphone Cords Breaking
$1,500 Abbott Award
Michael Paradise, Marissa Rubino, and Jenna Kummerer
Bartlett High School – Bartlett, IL
Instructor: Janine Stevens

Locking Extension Cord Plug
$1,000 Abbott Award
Hubert Gawin
Niles West High School - Skokie, IL
Instructor: Ken Albert

2015 Kansas City Engineering Design Competition

34 Team Project Submissions
35 Judges representing 6 industries and 7 Universities

Markus Gentry and Jackson Daniel describe their winning entry

First place:
$5,000 in scholarships per team
Funding to attend an Entrepreneurship Workshop
Letter and Certificate of Commendation
Plaque for School

Second and Third place:
$1,000 in scholarships per team
Funding to attend an Entrepreneurship Workshop
Certificate of Commendation
Plaque for School

Top Ten Circle and Five Wildcard Teams
Funding to attend an Entrepreneurship Workshop
Letter and Certificate of Commendation
Opportunity to Apply for FastTrac Entrepreneurship Program Scholarships

All Remaining Teams:
Letter of Recognition for entering the competition
For their Innovation Portal project entry Catholic Memorial High School Students Sam Aspinwall, Jared Bluma and Max Mutza won a $4,000 cash prize, a professional New Product Assessment Review through the Small Business Administration, and an offer to each of them of a Presidential Scholarship for four years of tuition at the Milwaukee School Of Engineering (MSOE).

Middleton (Wis.) High School student Jack Verstegen won second place and a $2,000 cash prize.

Jackson Boulanger, Sawyer Kobes and Matt Link, from Pulaski (Wis.) High School, took third place and won a $1,000 cash prize.

A team from Waunakee (Wis.) High School also earned Honorable Mention for their tungsten carbide electronic security bicycle lock.

Middleton (Wis.) High School students Ben Kalvin, Lex Peterson and Emily Walther earned Honorable Mention for their project, Running Arm Form.
Four Design & Problem Solving Competitions hosted on the Innovation Portal -

Open to ALL high school students - beginning in August of 2015
Open to all high school students age 13 - 18 everywhere

425 students, 5 Categories, 138 Team Entries representing 12 States, 5 Countries, 54 Schools

136 Judges representing 34 States, the District of Columbia, 8 countries – 67 Universities and Colleges and 41 Industries
Gulliver Prep engineering students create system to fight malnutrition
EDD Students from Gulliver Prep at the Kennedy Space Center

Health & Nutrition Division of the Conrad Spirit of Innovation Challenge
In a single account, students can create as many project portfolios as they want.

Competitions and other Opportunities

Project feedback and guidance using the Rubric and Scored Examples

Teacher

Project Partners

Project Mentors
2015 WISCONSIN ENGINEERING DESIGN COMPETITION

A statewide competition for Wisconsin students enrolled in the PLTW Capstone Courses - "Engineering Design and Development" or "Biomedical Innovation"

REGISTER

Register individual interest early – get on the competition email list

BUILD THE PORTFOLIO

SUBMIT

Submit as a team during submission window

Students and Student Teams

Innovation Portal Team

Competition Administrator

Scores

Communication

Judges
Connecting the original design work of students to opportunities and the national STEM conversation

free, open and secure for use by all students, teachers, and mentors - everywhere
The proposed solution is well-substantiated with STEM principles and practices applicable to all or nearly all design requirements and ……
“The problem is clearly and objectively identified and defined with considerable depth, and it is well elaborated with specific detail; the justification of the problem highlights the concerns of many primary stakeholders and…”
…the portfolio submission site, called the Innovation Portal, is already up and running.

The Innovation Portal provides a rubric for evaluating projects structured around the design process. (See “The Design Process,” page 58.)

Students submit their work, get feedback from their teachers, glean inspiration from other projects and refine their designs as they go.

The rubric’s universality makes the design process applicable to seventh grade math projects as well as graduate school engineering portfolios, both of which are represented among the design submissions of the site’s 12,000 registered users.”