

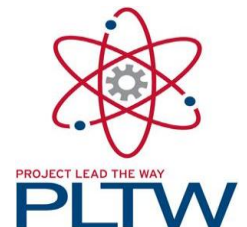
The Development and Implementation of a Potential AP for Engineering Design Using a Rubric-Based e-portfolio

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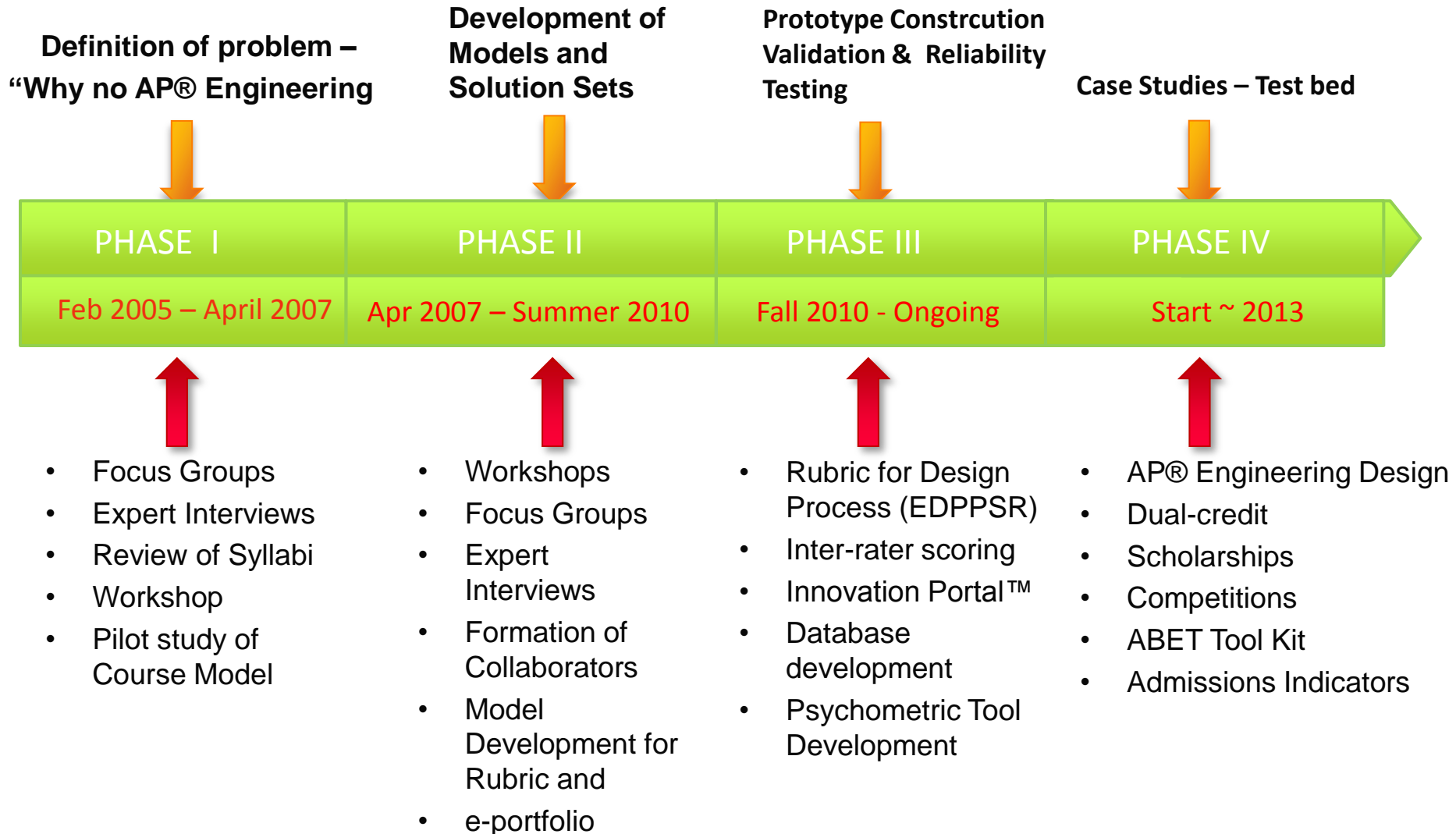


The Motivation for Engineering

- **AP[®]** – Parents and school systems view AP[®] as a pathway to college placement and acceptance.
- **Weighted GPA** – Honors, gifted and talented, and AP impact the weighted average.
- **Inclusion** – Level the ‘playing field’ and increase diversity.
- **Align Project-based Activities** – Recognize student achievements in both formal and informal education settings.
- **Student learning trajectories** – Research and document for: design process, problem-solving, team work, and creativity.

Phases and Timelines

EDPPSR e-portfolio and Case Studies



Toward AP Adoption

➤ Basic College Board Criteria

1. **Recognition and acceptance** by the post-secondary constituents. Willingness of large numbers of US higher education institutions to grant credit and exemption from an existing undergraduate course.
2. **Availability of professional development** and related curriculum and instructional resources for teachers.
3. A sustainable **financial model**.

Common Syllabi Elements

- **Design process**
- Problem solving
- Creative thinking
- Teaming
- Technical and engineering communications
- Ethics
- Basic computer tools
- Time management
- Project management
- Modeling
- Apply mathematics and science knowledge
- What it means to be an engineer
- Role in society

Developing an accessible e-portfolio resource

The screenshot shows the top of the Innovation Portal website. At the top left is the logo for Innovation Portal Beta, which includes a stylized globe icon. To the right of the logo is the tagline: "Identify a Problem. Go after a solution. Document your work. Connect with Opportunities." Further right, there is a user account link: "My Portfolio | Mail, Logout". Below the tagline is a search bar with a "Search" button. A horizontal navigation menu contains the following items: Home, About the Innovation Portal, Sponsors & Partners, How to Use the Portal, FAQs, and Report Beta Testing Issues. Below the navigation menu is a secondary menu with buttons for "View", "Edit", "Track", and "Convert". The main content area features three photographs of students: a male student working on a circuit board, a female student smiling, and two male students working together on a project. To the right of these photos is a text block that reads: "The Innovation Portal enables ...students to create, maintain and share digital portfolios. The portfolios can be used to meet a class requirement or they can be used to submit the portfolio to a scholarship or open contest. The contest owners - or anyone else invited by the student - can evaluate a student's portfolio." Below this text is a call-to-action area with a dark green button that says "Register Now!" and a green button that says "Sign In!". At the bottom of the page, there are four green boxes, each with an icon and a title: 1. "Project Resources" with a wrench icon, describing a collection of resources from instructors and professionals. 2. "How the Portal Works" with an information icon, explaining the organization around the engineering design process. 3. "Connect Your Organization" with a power icon, describing the standardized format for submission of student work. 4. "Opportunities for Recognition" with a star icon, describing how the portfolio speaks volumes about talents and capabilities. Each box includes a "Learn More" button.

InnovationPortal Beta

Identify a Problem. Go after a solution.
Document your work. Connect with Opportunities.

My Portfolio | Mail, Logout

Search

Home About the Innovation Portal Sponsors & Partners How to Use the Portal FAQs Report Beta Testing Issues

View Edit Track Convert

The Innovation Portal enables
...students to create, maintain and share digital portfolios. The portfolios can be used to meet a class requirement or they can be used to submit the portfolio to a scholarship or open contest. The contest owners - or anyone else invited by the student - can evaluate a student's portfolio.

Register Now! or Sign In!

Project Resources
We collect resources, examples and advice from hundreds of instructors and design process professionals to help you build your portfolio.
[Learn More](#)

How the Portal Works
The IPortal is organized around the engineering design process itself, rather than specific lessons from a given course or curricula, ...
[Learn More](#)

Connect Your Organization
The online and standardized format for submission of student work provides industry and post-secondary representatives with a cohesive, uniform product.
[Learn More](#)

Opportunities for Recognition
Your portfolio speaks volumes about your talents and capabilities. You can access contests and opportunities right from the Innovation Portal.
[Learn More](#)

www.innovationportal.org

Building a portfolio

[Home](#)[About](#)[FAQ](#)[Resources & Examples](#)[News](#)[Contact Us](#)[Dashboard](#)[Profile & Password](#)[Announcements](#)[Report Problems](#)

Element C: Presentation and justification of solution design requirements



Saved

[View](#)[Edit](#)

Please see the pdf file below for the contents of this portfolio subsection.

Document:



Element C Presentation and justification of solution design requirements.PDF

University of Virginia
ENGR 1520

[Manage Portfolio Members](#)

[Snapshots](#) [Reviews](#)

[Submit to Opportunities](#)

Portfolio Elements

[Portfolio Home](#)

A Presentation and justification of the problem

[Resources](#)[EDPPSR](#)

B Documentation and analysis of prior solution attempts

[Resources](#)[EDPPSR](#)

C Presentation and justification of solution design requirements

[Resources](#)[EDPPSR](#)

D Design concept generation, analysis, and selection

[Resources](#)[EDPPSR](#)

E Application of STEM principles and practices

[Resources](#)[EDPPSR](#)

F Consideration of design viability

[Resources](#)[EDPPSR](#)

Connecting to resources...

[Home](#)[About](#)[FAQ](#)[Resources & Examples](#)[News](#)[Contact Us](#)[Dashboard](#)[Profile & Password](#)[Announcements](#)[Report Problems](#)

Element C Resources - Presentation and justification of solution design requirements



These resources and examples are specific to helping students develop a comprehensive and robust portfolio entry for Element C

"Presentation and justification of solution design requirements"

EXAMPLES: Annotated Portfolio Examples for Element C

1. Snow Clear LED Traffic Signal Visor - (PDF) averaged reviewer score = 1
- 2.
- 3.

IDEAS and RESOURCES: Presentation and justification of solution design requirements

and the rubric

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Presentation and justification of solution design requirements

Score	Description
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5	Design requirements are listed and prioritized, and they are consistently clear and detailed; these design requirements presented are consistently objective, measurable, and they would be highly likely to lead to a tangible and viable solution to the problem identified; there is evidence that requirements represent the needs of, and have been validated by, many if not all primary stakeholder groups.
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4	Design requirements are listed and prioritized, and they are generally clear and detailed; these design requirements presented are nearly always objective and measurable, and they would be likely to lead to a tangible and viable solution to the problem identified; there is evidence that requirements represent the needs of, and have been validated by, several primary stakeholder groups.
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3	Design requirements are listed and prioritized, and they are generally clear and somewhat detailed; these design requirements presented are generally objective and measurable, and they have the potential to lead to a tangible and viable solution to the problem identified; there is evidence that requirements represent the needs of, and have been validated by, at least a few primary stakeholder groups.
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Next Steps

- **Continue the research** to address the College Board's Criteria.
- **Review portfolios** across '**Challenges,**' **programs and faculty** committed to participate (FIRST®, SeaPerch®, PLTW, TN Tech, UMD, USNA, UVA, and Vanderbilt).
- **Understand, define and document** how the EDPPSR / e-portfolio aligns to grades 10 to 16 informal activities, Introduction to Engineering courses, course related design projects and CAPSTONE courses.
- **Develop and test** training processes for the scorers / raters, teachers, faculty and mentors.
- **Develop scoring and reporting tools.**

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