**Project-based Learning Strategy**

**Surface Facility Design and Operations**

### Background

*Modern Engineering deals:*
- Uncertainty and incomplete data
- Competing demands from clients, governments, environmental groups, etc.
- Continual technological and organizational change
- Commercial realities
- Legal consequences

*Required Skills in:*
- Human relations
- Broader perspective (social, environmental and economic issues)
- Technical competence

*The problem*

Universities are graduating Engineers with good knowledge of fundamental engineering science and computer literacy, but they don’t know how to apply that in practice!!!

### Project-based Learning

**PLB** allows students to gain knowledge and skills by working for an extended period of time on an authentic, engaging and complex problem.

**The project must ...**

- Be focused on student learning goals,
- Be framed by a meaningful problem to solve,
- Engage students in a rigorous, extended process of asking questions, finding resources, and applying information,
- Features real-world context, tasks and tools, quality standards, etc.,
- Allow students to make some decisions about the project, including how they work and what they create.

### Surface Facility Class

This course will cover:

- Surface facilities typically required in the O&G industry,
- Basic operation and design of surface facility equipment
- Basic principles to design and evaluate different midstream processes,
- Potential operational problems to these processes and mitigation options.

### What is Changing?

- This is a new class!!! However, I typically teach a class based on lectures.
- This new class will be project based.
- Each class unit will have:
  - In/out class activities,
  - Out class activities will be characterized by activities with Bloom's Taxonomy outcomes level 1,
  - In class activities will be characterized by activities with Bloom's Taxonomy outcomes level 2 and higher,
  - Open ended project to consolidate unit content, engage students in rigorous thinking, expose student to field cases and help students to develop human and technical skills

**PBL Intended Outcomes**

- Investigate, critique and summarize available technologies regarding surface facility equipment for unconventional production conditions and environments,
- Increase long-term retention of content,
- Improve problem-solving and collaboration skills,
- Improves students' attitudes towards learning.

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**Research Interest:** Well Production and Optimization, Multiphase Flow, Artificial Lift System

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