Project-based Global Learning Across STEM: Examples from Worcester Polytechnic Institute

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Abstract

What does it mean to be a global polytechnic? How do you instill a sense of critical global citizenship across students whose training is focused on science, technology, engineering, and math?

In the next edition of Global Learning X the Disciplines (GLxD), join Kathleen Head and Sarah Stanlick from Worcester Polytechnic Institute (WPI) as they share how WPI has leveraged project-based learning in service to student transformation.
Key Learnings

01 Understand and reflect on a model for integrative global learning across the curriculum in your context

02 Appreciate the local and global nature of global learning and critical global citizenship

03 Engage in dialogue about your context and reflect on areas of appreciation or change

04 Connect and articulate the opportunities for global learning to connect with inclusion, equity, and justice
The Elements of the WPI Plan

The pioneering elements of a WPI education set the footing for a personal journey—yours. Here you'll be encouraged to chart your own path and do things you've only imagined.

- **Pursue Your Passion**
- **Learn How to Learn**
- **Project-Based Learning**
- **Global Immersion**
- **Beyond the Classroom**
- **Personal Impact**
WPI’s undergraduate learning outcome approved by the Faculty, May 3, 2019, states that graduates of WPI will:

“demonstrate global and intercultural competency by developing the capacity to identify, explain, and critically analyze the forces (such as cultural, historical, political, economic) that shape the self and others as they engage with local and global communities.’
Critical Global Citizenship (Andreotti, 2006)

In order to understand global issues, a complex web of cultural and material local/global processes and contexts needs to be examined and unpacked.

This generation, encouraged and motivated to ‘make a difference’, will then project their beliefs and myths as universal and reproduce power relations and violence similar to those in colonial times. How can we design educational processes that move learners away from this tendency?
What does this mean in practice?

- Students can productively balance creative tension between...
  - Local <--> Global
  - Action <--> Reflection
  - Intent <--> Impact
  - Agency <--> Interdependence
FOR YOUR CONSIDERATION...

Does your department/program/initiative take a critical global citizenship approach?

If so, how? Is there anything you could adjust?
Essential Elements of the Experiences

- Community-based
- Integrative
- Scaffolded
- Sustainable
- Co-creation
- Critical Reflection
How are we attending to curricular global learning?

First-Year Great Problems Seminar
Global Projects for All
Humanities Projects
Major Qualifying Project
Graduate pathways
## Global School as Collective Impact Backbone

<table>
<thead>
<tr>
<th>Common Vision</th>
<th>Shared Measures</th>
<th>Mutually Reinforcing Activities</th>
<th>Continuous Communication</th>
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</thead>
<tbody>
<tr>
<td>Shared definition of global learning</td>
<td>Global Engagement Survey</td>
<td>Advising</td>
<td>Content / LMS</td>
</tr>
<tr>
<td>Prioritization of global learning in official learning outcomes</td>
<td>Shared assignments/ reflections</td>
<td>Cross-college partnership / Advising</td>
<td>Emails and news</td>
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<td></td>
<td>External surveys</td>
<td>Celebrations</td>
<td>Director's Meetings</td>
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<td>Professional Development</td>
<td>All-college communication</td>
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</tbody>
</table>
For your consideration...

How are you integrating global learning within or across your curriculum / across disciplines?
Signature Program: Great Problems Seminar

- Team Taught
- 2 Terms
- Project-Based
- Immersive
- First Year
- Global Grand Challenges
- Sustainability
GPS Learning Outcomes

- Team Work
- Research
- Writing
- Presenting
- Approach to Problems
- Cultural Awareness
- Values
WPI Global Projects Program
Humanities & Arts Projects

HUA Curriculum
- 6 course requirement
- 3 course HUA Capstone Project

Projects
- 1st or 2nd Year
- 4-5 weeks
- Immersion in art, language, culture, literature, etc.

Sites
- London, England
- Buenos Aires, Argentina
- Konstanz, Germany
- NEOMA Business School, France
- Various cities, Japan
Signature Program: Interactive Qualifying Project

- 24 Students
- 2 Advisors
- 6 Projects
- 6 Project Sponsors
- Immersive experience in a foreign culture
- Weekend Excursions
Major Qualifying Project

- Senior Year
- 1 unit, relevant to academic major
- Project teams of 1-4 students
- Professional-level challenge, e.g. design or research
- Sponsored by corporations or research labs
- 11% off-campus
Assessing Student Transformation

- Ethical orientation
- Respect for Cultures and Diversity
- Interdisciplinary understanding: Technology x Society
- Ethical orientation
- Understanding of self and potential for impact in the world
- Understanding of Global Issues
## Pre-, During, and Post-Experience: IQP

<table>
<thead>
<tr>
<th>Pre-PQP</th>
<th>ID2050 + PQP</th>
<th>IQP</th>
<th>Post-IQP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Preparation</td>
<td>Weekly Team Meetings</td>
<td>IQP In-Location</td>
<td>End: Participation in the GES</td>
</tr>
<tr>
<td>*Not all IQPs have pre-cultural prep</td>
<td>Assignments</td>
<td>Work with Sponsor</td>
<td>Reflection</td>
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<tr>
<td></td>
<td>Critical Reflection</td>
<td>Regular Meetings w/ sponsor and advisors</td>
<td>Extending the work (conference presentations; awards; etc)</td>
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<td></td>
<td>Final Proposal</td>
<td>Fieldwork</td>
<td></td>
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<tr>
<td></td>
<td>Beginning: Participation in the GES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiarization with Language, Culture, Art, and Current Events</td>
<td>Effective Team Dynamic</td>
<td>Successful Deliverables and Research Completed</td>
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</tr>
<tr>
<td></td>
<td>Proposal</td>
<td>Final Report/Booklet</td>
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*Not all IQPs have pre-cultural prep*
Indicate the extent to which your WPI formal project experience (through GPS, HUA capstone (enquiry seminar/practicum or sufficiency), your IQP, and/or your MQP) expanded your:

- Respect for cultures outside your own
  - Very much: 35.2%
  - Much: 22.2%
  - Moderately: 24.2%
  - A little bit: 18.5%

- Understanding of the connection between technology and society
  - Very much: 33.7%
  - Much: 29.3%
  - Moderately: 23.8%
  - A little bit: 13.1%

- Understanding of ethical responsibilities
  - Very much: 29.4%
  - Much: 25.7%
  - Moderately: 27.5%
  - A little bit: 17.5%

- Awareness of how your decisions affect and are affected by others
  - Very much: 27.2%
  - Much: 30.7%
  - Moderately: 26.2%
  - A little bit: 15.8%

- Understanding of global issues
  - Very much: 26.0%
  - Much: 25.3%
  - Moderately: 29.8%
  - A little bit: 18.8%
DEIJ x Global @ WPI

Curricular
- Pre-PQP cultural prep
- ID2050 community engagement and ethics
- Adaptation and use of modules from Collaborative Toolkit

Institutional
- Sustainable Inclusive Excellence Action Plan
  - Inclusive Campus Culture
  - Equity in Teaching/Research
  - STEM Access and Retention
  - Diverse Talent
- SDG Working Group
- Community-based Learning Collaborative

Administrative
- Justice Equity and Transformation (JET) initiative and internal grant funding
- Addressing operational policies and procedures
- Cross-cultural training and professional development
For your consideration...

What is one way that your organization is connecting DEIJ and Global Learning?
Key Takeaways: 3 Things

• WPI has a comprehensive ecosystem – students, faculty, staff, and service providers – that supports Global Learning across the curriculum

• The Global School at WPI was created to serve as the supportive backbone of all these efforts / collective impact

• Our Global Learning cuts across all curriculum/disciplines and engages intercultural competency, cultural humility, and DEIJ
THANK YOU!

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