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

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THE FORUM
ON EDUCATION ABROAD

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.
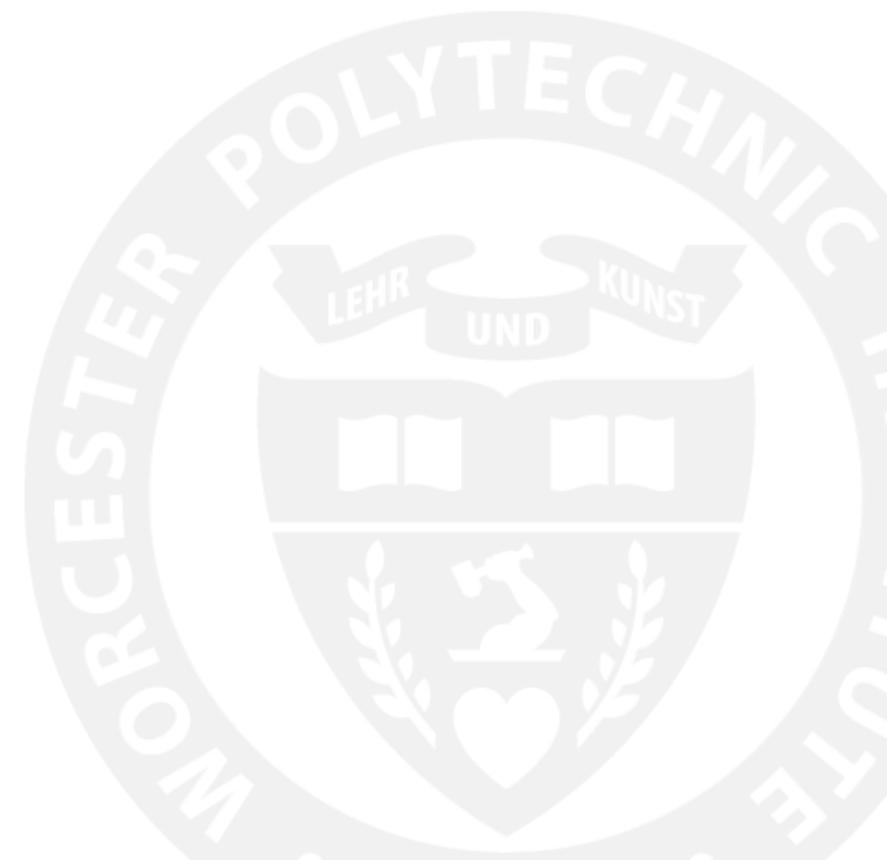
Key Learnings

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

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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

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Project Based Learning

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Global Learning @ WPI

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.'

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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?

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What does this mean in practice?

- Students can productively balance creative tension between…

  - Local <--> Global
  - Action <--> Reflection
  - Intent <--> Impact
  - Agency <--> Interdependence

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FOR YOUR CONSIDERATION...

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

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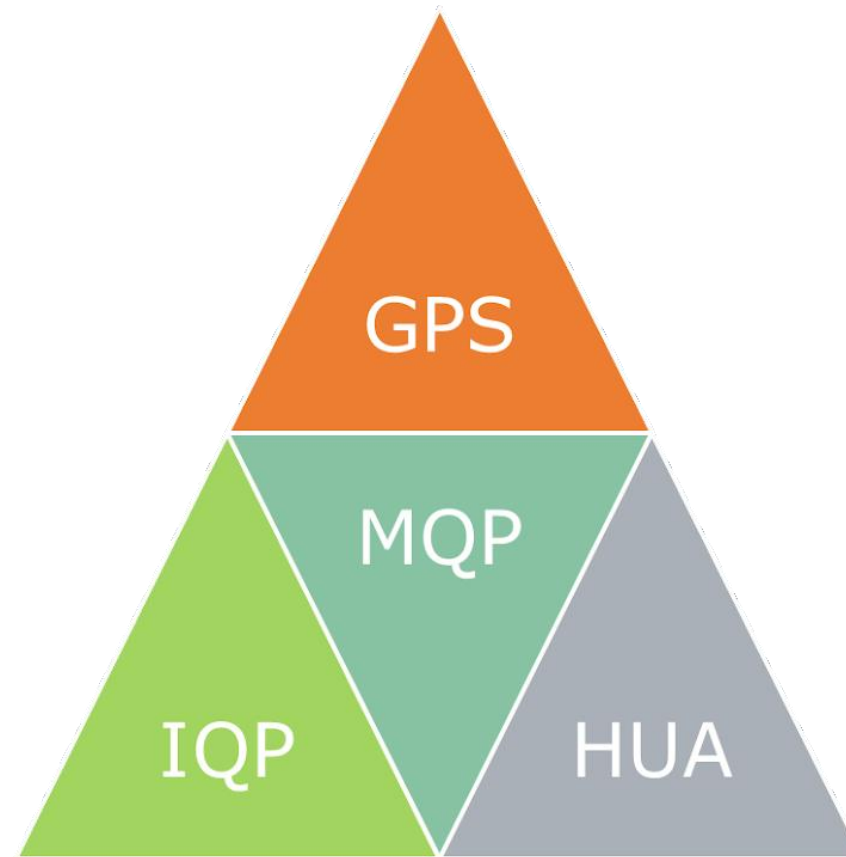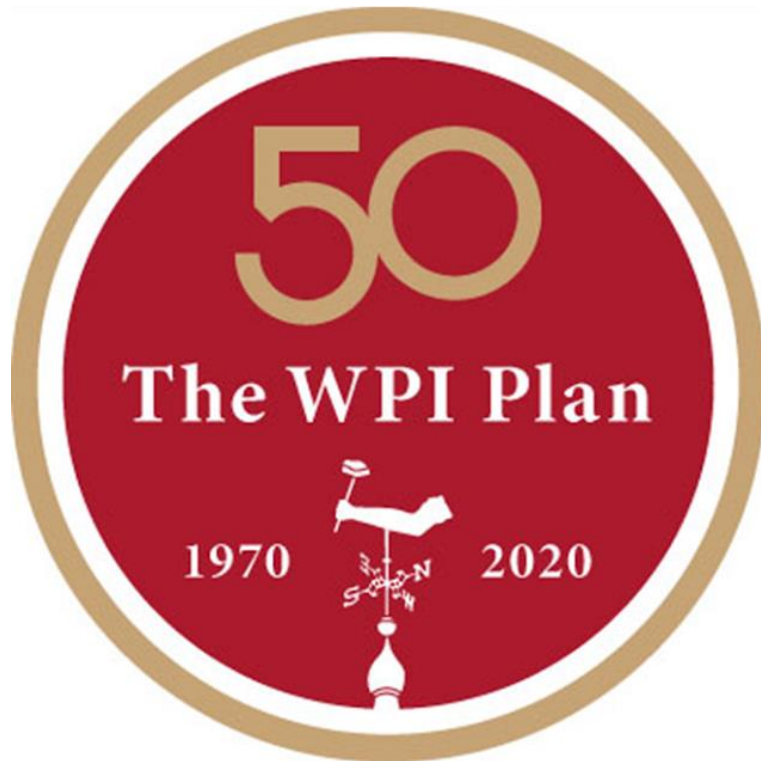
Essential Elements of the Experiences

Community-based	Integrative	Scaffolded
Sustainable	Co-creation	Critical Reflection

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How are we attending to curricular global learning?

First-Year Great Problems Seminar

Global Projects for All

Humanities Projects

Major Qualifying Project

Graduate pathways

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Global School as Collective Impact Backbone

Global School ⬆⬇

Common Vision	Shared Measures	Mutually Reinforcing Activities	Continuous Communication
Shared definition of global learning Prioritization of global learning in official learning outcomes	Global Engagement Survey Shared assignments/ reflections External surveys	Advising Cross-college partnership / Advising Celebrations Professional Development	Content / LMS Emails and news Director's Meetings All-college communication

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For your consideration...

How are you integrating global learning within or across your curriculum / across disciplines?

SCAN ME

Signature Program: Great Problems Seminar

Great Problems Seminar

Goats on a Mission

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

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GPS Learning Outcomes

- Team Work
- Research
- Writing
- Presenting
- Approach to Problems
- Cultural Awareness
- Values

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WPI Global Projects Program

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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

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Signature Program: Interactive Qualifying Project

24 Students

2 Advisors

6 Projects

6 Project Sponsors

Immersive experience in a foreign culture

Weekend Excursions

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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

photo courtesy of ACP

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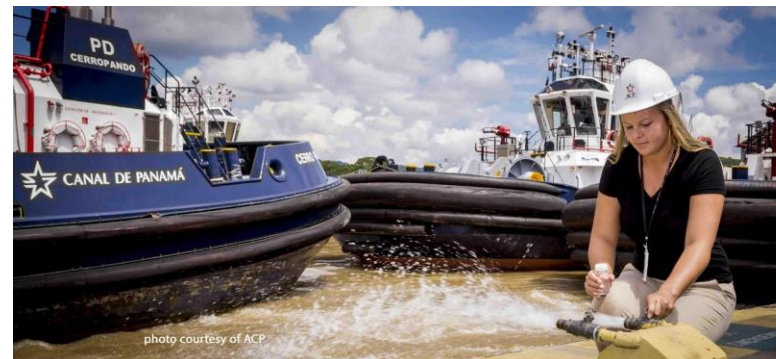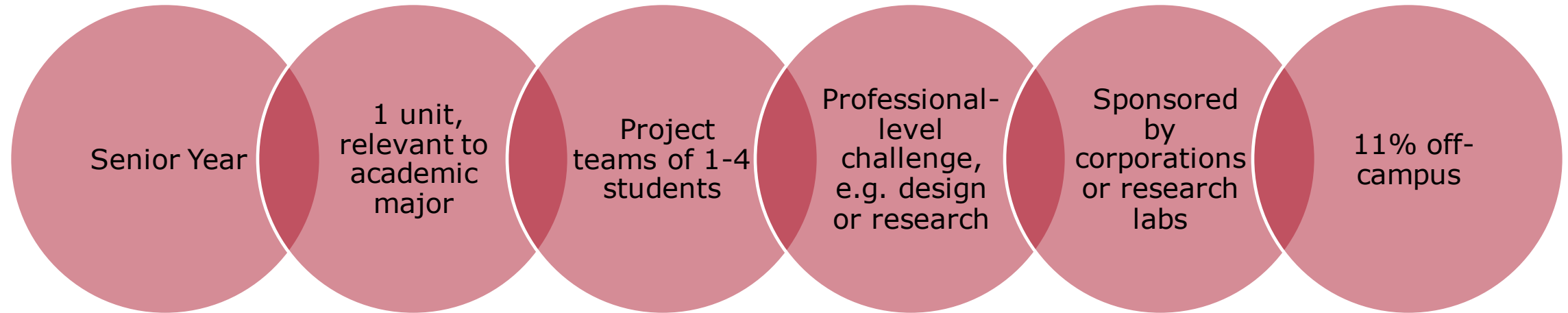
Assessing Student Transformation

Ethical orientation

Respect for Cultures and Diversity

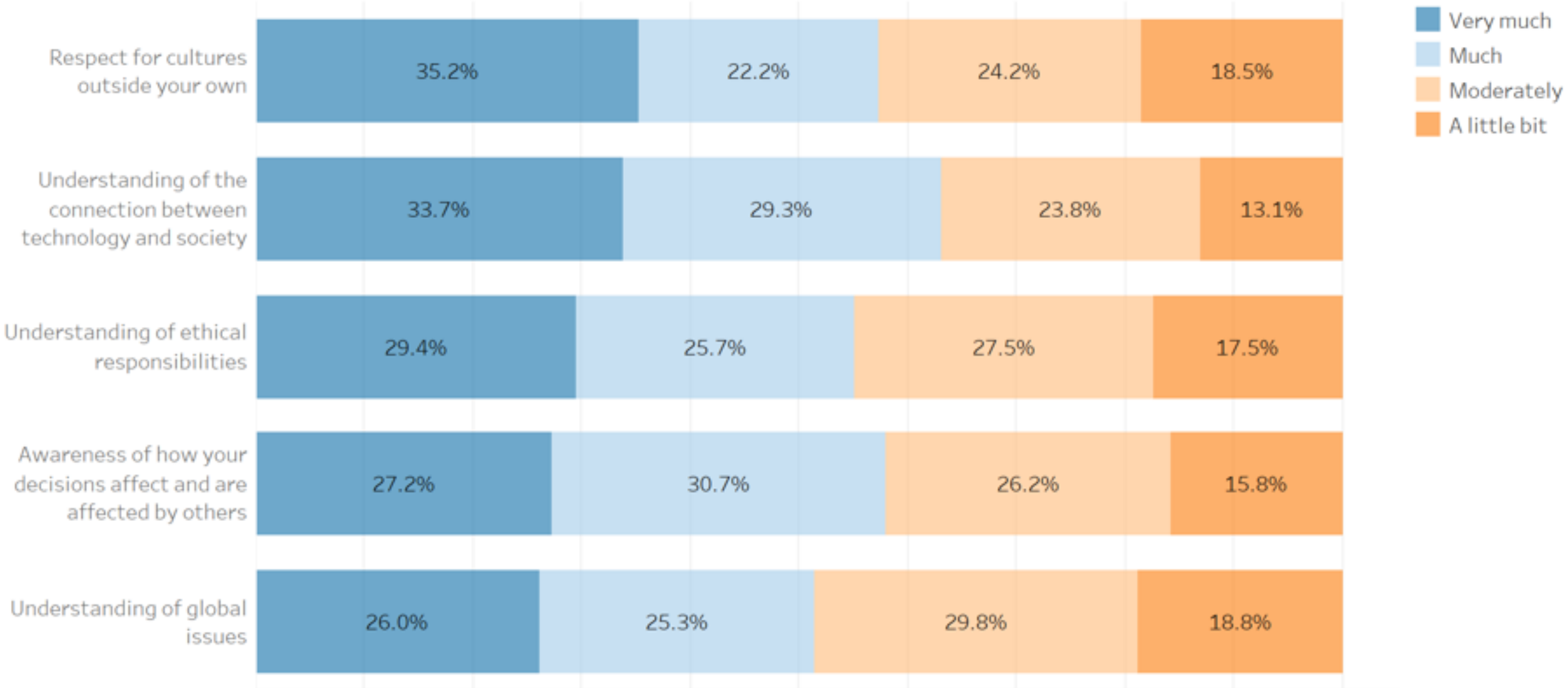Interdisciplinary understanding: Technology x Society

Ethical orientation

Understanding of self and potential for impact in the world

Understanding of Global Issues

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Pre-, During, and Post- Experience: IQP

Pre-PQP	ID2050 + PQP	IQP	Post-IQP
Cultural Preparation *Not all IQPs have pre-cultural prep	Weekly Team Meetings Assignments Critical Reflection Final Proposal Beginning: Participation in the GES	IQP In-Location Work with Sponsor Regular Meetings w/ sponsor and advisors Fieldwork	End: Participation in the GES Reflection Extending the work (conference presentations; awards; etc)
Familiarization with Language, Culture, Art, and Current Events	Effective Team Dynamic Proposal	Successful Deliverables and Research Completed Final Report/Booklet	Successful Deliverables and Research Completed Final Report/Booklet

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) <u>expanded your</u>:

	Very much	Much	Moderately	A little bit
Respect for cultures outside your own	35.2%	22.2%	24.2%	18.5%
Understanding of the connection between technology and society	33.7%	29.3%	23.8%	13.1%
Understanding of ethical responsibilities	29.4%	25.7%	27.5%	17.5%
Awareness of how your decisions affect and are affected by others	27.2%	30.7%	26.2%	15.8%
Understanding of global issues	26.0%	25.3%	29.8%	18.8%

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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

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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

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THANK YOU!

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