FACULTY PERSPECTIVES ON STUDENTS AND SUSTAINABILITY: FROM ENGAGEMENT TO EMPOWERMENT

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Building Community Partnerships Inside and Outside the Classroom

Case Study from Hawaii Pacific University (HPU) and Hui o Ko’olaupoko (HOK) Efforts for Watershed Protection
Why do we engage our students?

Better informed citizens
• Awareness
• Understanding
• Critical thinking

Agents of change
• Tools
• Practical Skills
• Experience

Sustainability leaders
• Vision
• Strategy
• Collaboration

ENGAGEMENT
EMPOWERMENT
Competence is having the necessary knowledge, skills, and attitudes for successful task performance and problem solving

(Spady, 1994; Baartman et al., 2007 as cited by Wiek, 2010)

Competencies in sustainability involve the necessary knowledge, skills, and attitudes for successful task performance and problem solving with respect to real-world sustainability problems, challenges, and opportunities

(Dale & Newman, 2005; Rowe, 2007; Barth et al., 2007 as cited by Wiek, 2010)
Sustainability Research and Problem-Solving Competence

Systems Thinking Competency
Anticipatory Competency
Interpersonal Competency
Normative Competency
Strategic Competency

"Linking knowledge to action"

(Wiek, 2010)
How do we engage our students?
Materials flow into cities and waste is emitted.

Paul Bunje 2010
Key Elements of LID

Conservation
Preserves native trees, vegetation and soils.
Maintains natural drainage patterns.

Small-scale Controls
Mimics natural hydrology and processes.

Customized Site Design
Ensures each site helps protect the entire watershed.

Directing Runoff to Natural Areas
Encourages infiltration and recharge of streams, wetlands and aquifers.

Maintenance, Pollution Prevention and Education
Reduces pollutant loads and increases efficiency and longevity.
Educates and involves the public.
Why build a rain garden?

- Nutrients
- Phosphorous
- Heavy Metals
- Groundwater recharge
- Aesthetics

http://www.auburnhills.org/index.asp?Type=B_BASIC&SEC=%7B842364E2-C8C3-42D4-984E-8F2773D5F3C2%7D
Anatomy of a rain garden
**Storm water management**

- More volume, faster peaks, no baseflow

- Pre-development
- Post-development (without controls)
- Post-development (with controls)
Calculating rain garden size

- Size is function of:
  - Contributing drainage area
  - Rainfall
    - 1.5 inches rainfall depth for Hawaii
    - 90% of all storms
  - Soil infiltration rate
  - Ponding depth
Calculating rain garden size

<table>
<thead>
<tr>
<th>Infiltration Rate (in/hr)</th>
<th>Sizing Factor % of CDA</th>
<th>Contributing Drainage Area (e.g. roof size in sq. ft.)</th>
<th>Size (Sq.ft.)</th>
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</table>
Calculating rain garden size

30' x 19' = 570 sq. ft.
15' x 19' = 285 sq. ft.
Measuring rain garden slope
Constructing overflow
Planting native vegetation
Maintaining the rain garden
Three weeks later...

- ~160 sq. ft.
- <9” ponding depth
- ~60 volunteer hours (not everyone worked hard, or at all)
- $367
What lessons have we learned?

- Strengthened community partnership
- Gave students a sense of ownership, responsibility, fellowship
- Overlapped with other activities and classes
- Provided great communication tool
- Constrained by time!!
  - Prep for project (e.g., infiltration tests)
  - Class allocated time
- Let the students pick the next project!
Rain Gardens

When it rains, stormwater drainage from roofs, roads, and parking lots can carry bacteria, oils, and other pollutants directly to our streams and beaches. This rain garden here uses native soils and plants to remove pollutants and replenish groundwater while beautifying our landscape.

Look around! Can you find what drains to this rain garden?

Do your part to protect our waters. Install a rain garden of your own!

For more information on rain gardens, please contact CNMI Coastal Resources Management (670) 664-8300.
What should student engagement look like in 2020?

- Transdisciplinary
- Service learning
  - Even more community partnerships
- Experiential learning and project based
  - From start to finish
  - Let the students identify projects for class to then implement and monitor
  - Incorporate other skills e.g., grant writing
- More critical thinking and problem solving
Thanks to the Rain Garden Team!!

- Hui o Ko’olaupoko
  - Todd Cullison, Kristin Mailheau, Joelle Barber

- HPU
  - Dr. Regina Ostergaard-Klem’s Natural Resource Management and Environmental Policy classes
  - Dr. Stephen Allen’s Methods of Environmental Science class and lab
  - Steve Hendricks, Hawaii Loa Facilities
Mahalo!
To contact HOK:
http://www.huihawaii.org/

http://www.huihawaii.org/projects_documents/
RainGardenManual-web-res-smaller.pdf
References
