Teaching Sustainability Through Problem Based Learning Communities

Professional Development for the Teachers of Tomorrow's Green Economy Technicians

Adriana Bishop and Scott Rollins
Spokane Falls Community College, Spokane, WA

@scott_rollins
Outline

• Overview of recent observations regarding the "green economy"
• Our approach to training technicians for the new green economy
• Successes & challenges with our 1st cohort
• Plans for our next workshop
The Green Economy

• The “green economy” is growing
• Sustainability is being integrated into existing jobs
• New green job sectors of the economy are limited
• Industries in the Spokane region highlighted many sustainability skills gaps
• We feel these skills gaps can be addressed by teaching sustainability through integrated curricula and problem-based learning.
Sustainability

Environment

Society

Economics

Sustainability
Traditional STEM Courses

- Specialized knowledge
- Problem solving
- Analytical thinking
- Ability to work independently
Spokane Area Workforce Development Council Initiative

• Initiative started as an attempt to create a consortium centered on Clean-Tech companies and their future workforce needs
• Defining Clean-Tech companies was difficult
• Companies involved represented many industries and finding commonality among them was even more difficult
• One commonality did start to emerge – the value placed on sustainability
• Clean-Tech Workforce Summit entitled “Sustainable Skills – Building the 21st Century Workforce.”
Sustainable Workforce Needs: Sustainable Skills

• Communication
• Analytical & Research Skills
• Computer / Tech Literacy
• Flexibility
• Interpersonal Abilities

• Leadership
• Multicultural Sensitivity
• Planning and Organizing
• Problem Solving
• Teamwork

https://vimeo.com/54534878 (10:54)
Initial Concept

• Interdisciplinary learning communities centered around the theme of sustainability.
• Would allow students to earn general education requirements, while developing knowledge and skills in sustainability
• If students could earn a sustainability certificate in the process, it could make them more marketable with sustainability-minded businesses
NSF ATE Program

• Funding for research and education in 2-year STEM tech pathways
Our Approach

• Provide teacher training in STEM tech pathways
• Sustainability training
• Learning community training (interdisciplinary teaming)
• Problem-based learning
• Facilitate business partnerships
1st Cohort Successes

• Eight pairs of teachers

• Pre- and post-workshop surveys suggest that participants
  • improved their knowledge of STEM technician opportunities
  • improved their knowledge of sustainability
  • enhanced their problem-based learning community pedagogy.

• “How competent do you feel in developing integrative assignments with sustainability outcomes?”
  • Pre-workshop mean: 4.22
  • Post-workshop mean: 8.00

• “How would you rate your understanding of problem-based learning (PBL)?”
  • Pre-workshop: majority had limited or some understanding of PBL
  • Post-workshop: majority had a strong understanding of PBL
1\textsuperscript{st} Cohort Challenges

- Participation in the online sustainability component was weak for various reasons, so some of the workshop was dedicated specifically to sustainability training.

- Due to weak online participation, many systems thinking components were removed from the workshop.

- Some teams had difficulty maintaining business partnerships.
Adjustments for 2nd Cohort

- Replace the Canvas LMS for online content delivery with a newsletter and blog
- Make better use of existing online materials for problem-based learning
- Integrate the learning community and problem-based learning components over three days
- Provide participants more time to develop their projects
- Proactively facilitate communication between teaching teams and business partners
The Next Workshop

Dates: June 19-23, 2017
Time: 8:30 a.m.– 4:00 p.m.
Location: Spokane Falls Community College, Spokane, WA
SpokaneCenterForSustainability.org
Acknowledgements

• The proposal for this work benefitted from the feedback of Mysti Reneau, Nancy Szofran, Barb Anderegg, and Elaine Craft. The PIs were part of the first SCATE Mentor-Connect cohort. Input and assistance from Laura Vickers of Avista Utilities was invaluable during project execution.

• This material is based upon work supported by the National Science Foundation under Grant No. DUE-1400699.

• Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.