

Land-Grant Educational Roles in Growing the Bioeconomy

D Raj Raman, PhD, PE

Associate Director of Educational Programs
Office of Biorenewables Programs

Associate Professor, Agricultural & Biosystems
Engineering

Iowa State University

Land Grant Mission

■ Research

- Knowledge creation

■ Outreach

- Knowledge dissemination to practitioners

■ Teaching

- Historically (and primarily) residential instruction
- But now includes e-mediated instruction
 - Tends to blur lines between outreach and teaching

Land Grant Mission

- The balance between Research, Outreach, and Teaching depends upon
 - Institutional culture
 - Faculty commitment
 - Student expectations
 - Administrative decisions that reflect
 - State stakeholder expectations
 - State funding availability
 - Alternative funding availability

The ISU Office of Biorenewables Products Serves All Three Land Grant Missions

■ Research

- Over \$30M externally funded since program inception

■ Extension

- Over \$7M externally funded since program inception

■ Teaching

- First biorenewable resources grad program in the US
- Multiple depts. with bioeconomy-relevant courses
- Rapid growth in bioeconomy sparks interest in educational initiatives
 - \$1.1M external funding last year
- Highlighted a need for greater coordination

Associate Directors Office Goals

- Single point of contact for ISU's broad range of efforts in biorenewable resources education
- Coordinate educational programs for K-12 educators, Community College faculty, ISU undergraduates, and ISU graduate students
- Work closely with ISU Extension to include industry in the development and deployment of educational programs related to biorenewable resources

Goal #1

- Oversee the graduate program in Biorenewable Resources & Technology (BRT)
 - Work with ISU and other faculty nationwide to develop additional coursework for the BRT program

Goal #2

- Serve as a single point of contact for ISU research faculty who are interested in building educational activities into their grants
 - These would include opportunities for K-12 and Community College Educators, as well as ISU and other undergraduate students

Goal #3

- Act as a liaison with community colleges and K-12 districts (primarily in Iowa, but throughout the region) who are interested in biorenewable resources education
 - Also act as a liaison with 1890 and Tribal institutions nationwide who are interested in biorenewable resources education

Goal #4

- Work with OBP staff to maintain an up-to-date website on ISU-affiliated educational opportunities in the area of Biorenewable Resources...

Website Components

- Certificate and non-certificate course listing
 - on topics such as biodiesel, ethanol, and other bioproducts
- Links to all ISU grad and undergrad programs of study with explicit biorenewable focus
- Form allowing visitors to suggest specific types of educational needs
 - Communicate to OBP monthly
- Links to resource materials and scholarship opportunities for K-12 and Community College educators
- Links to publicly available educational materials by ISU faculty and staff
 - E.g., lectures produced by the upcoming Virtual Education Center for Biorenewable Resources

Associate Directors Office Programs

2006 – 2007

Launch USDA Higher Education Challenge Grant

- Develop three new courses
 - Fundamentals of Biobased Products and Technologies
 - Production and Use of Biofuels
 - Thermochemical Processing of Biomass
- Offer using “Virtual Education Center” model
 - Video lectures
 - In-class instruction
- Team with
 - University of Kentucky
 - University of Idaho

Launch Coordinated Biodiesel Educational Effort

- Additional web resources...
 - Biodiesel training webpage
 - Biodiesel workshop opportunities
 - Relevant courses and programs of study
 - Assistance offered by ISU Outreach (CIRAS and others)
 - Lab service links
 - Student internship opportunities
 - Graduate training opportunities
 - K-12 and CC instructor opportunities

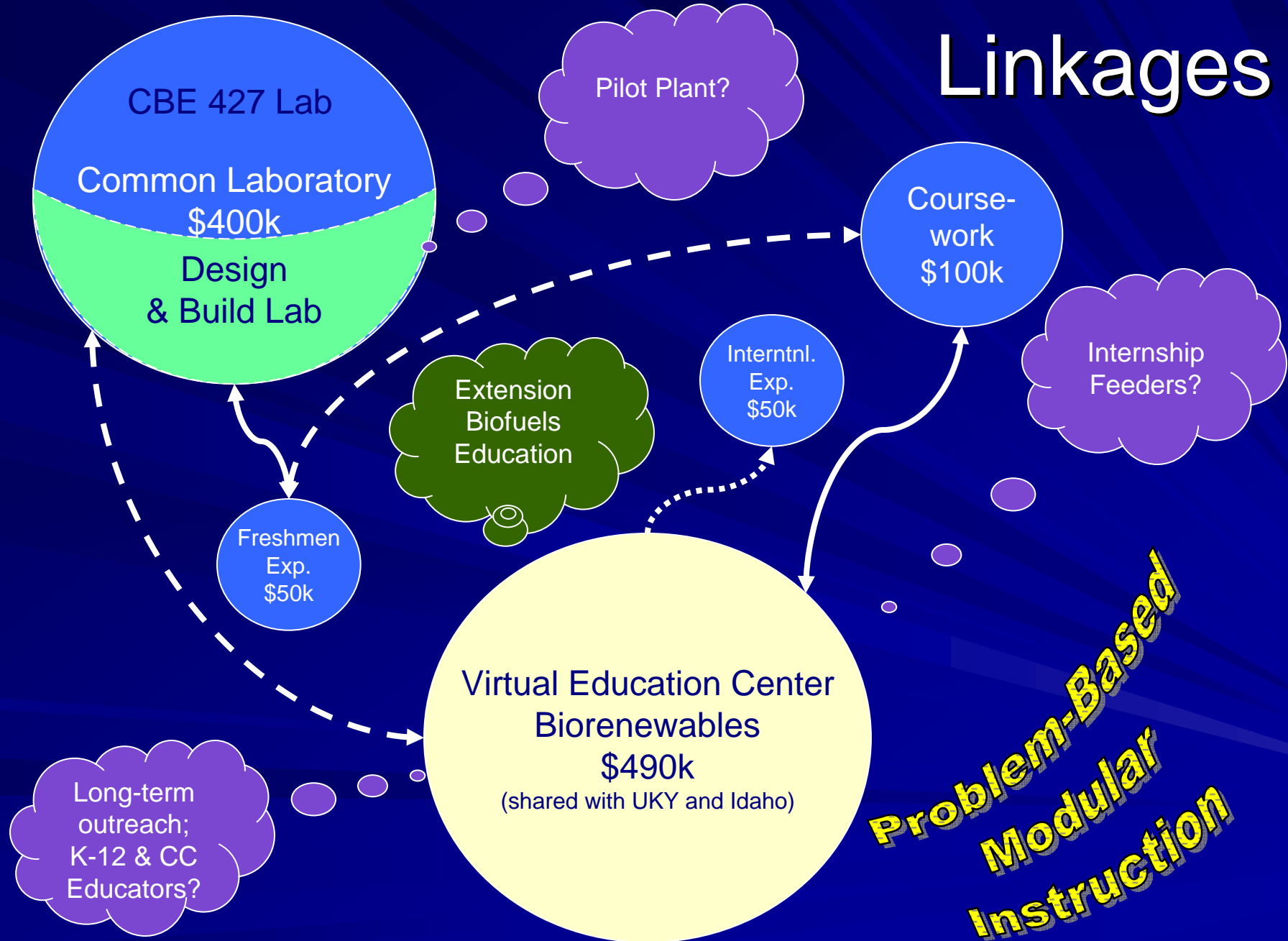
Launch Coordinated Biodiesel Educational Effort

- At least three interns from ISU programs placed with in Biodiesel facilities
- Heightened awareness in ISU undergraduate population about opportunities in biodiesel area
 - “Work in Iowa” job festival?
 - Companies could stress skill-sets they’re looking for
- Development of a biodiesel technology section for the ISU biofuels course
- Partnering with community colleges on biodiesel curricula

Launch Cargill Biorenew @ ISU Project

- Set-up 427 Lab
 - How modular can/should this be?
- Set-up Design & Build Lab
 - Develop clear vision for scope of this lab into which classes will it fit
- Develop and deliver freshmen experiences
- Develop and deliver two courses
- Organize and lead international experiences

Linkages



Develop New Proposals

- NSF ERC (Shanks, Nikolau)
- NSF ATE (Keck, Heck)
- IEC Biorenewable Energy Education (Genalo)
- Others

Closure

**Thank you
for your time!**