Comparative Ecology Education for Secondary Students
Educación de Ecología Relativa para Estudiantes de Escuela Secundaria

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CIESUP - Knowledge Crossing Borders 2012
Comparative Education

- Academic field comparing educational institutions, policies, & pedagogical practices across countries

- **Crosses Borders!**
  - Ecologists from Mexican & US colleges share survey methods for field courses
  - Instructors at *El Parque Nacional Barbilla* & *Shenandoah National Park* develop joint teaching modules for secondary school exchange students
  - Teacher-prep students from Egyptian & US colleges compare science standards & teaching approaches in “summer exchange” programs
Goals of Comparative Education

- To describe educational *institutions & systems*
- To compare content & skills *standards*
- To compare *curricula*
- To identify *best teaching practices*
- To highlight critical global *issues & problems*

- *All to improve educational approaches & foster global cooperation to better address problems - WCCES (1970)*
Comparative Ecology Education

- Where is ecology taught?
- Are there national content & skills standards for ecological literacy?
- How is ecology integrated in curricula?
- What are the best teaching practices for ecology?
- Does ecology highlight major global education issues & problems? Claro que sí!
  - Interconnected global change issues!
    - Biodiversity decline, climate change, & habitat loss
Ecology Education in the U.S.

Institutional Systems

• K-12 Schools
• Colleges/Universities
  – Science department programs w/ eco-concentrations
  – Ecology departments w/ eco-majors
• Non-Profits
  – Ecological Society of America
  – Ecology Institutes
  – Land Conservancies/Trusts
Ecology Education in the U.S.

Standards

• National Science Education Standards - NRC
• Benchmarks for Science Literacy - AAAS
• STEM - NSF
• National Science Teachers Association
  – Teaching practices & student skills - handout
• State Education Departments - PDE
  – Environment & Ecology content & skills standards
  – http://static.pdesas.org/content/documents/academic_standards_for_environment_and_ecology.pdf
Ecology Education in the U.S.

Curricula

• Primary
  – Little coverage, simple concepts

• Secondary
  – > coverage of complex concepts, students < prepared
  – No national curricular requirements!
    • Barriers to ecology education in N.A. high schools: Another alternative perspective; Cherif (1992) J Env Ed
  – Vary by district, state standards mandated
    • Ecological concept development of preservice teacher candidates: Empty opaque shells; Puk & Stibards (2010) International J Env & Sci Ed
Ecology Education in the U.S.

Higher Ed Curricula – WCU & US

- Non-ecology biology & teacher prep majors
  - Minimal Intro biology course coverage
    - Poole (2012) WCU MS Project
  - One ecology course required for many majors

- Eco-focused biology majors
  - Comprehensive lecture/lab based curriculum - handout
  - Research/internship opportunities
  - Field station opportunities
Ecology Education in the U.S.

Non-Profit Curricula

- Ecology/forestry institutes

- Local land conservancies
  - WCU, Gordon Natural Area
Using CE to Improve *Ecology* Education for Secondary Students

**CE Project**

- **What do we know?**
  - Mish-mash of institutional programs, standards, & curricula for ecology education

- **What we don’t *always* know?** *What works best!*

- **What to do?**
  - Use a CE approach to identify cross-cultural institutional systems, standards, curricula, & best practices for ecology education "to improve educational approaches & foster international cooperation to better address problems." - WCCES
Using CE to Improve *Ecology* Education for Secondary Students

1. US/Hong Kong Exchange - June 2012
   - University teacher-prep & high school faculty interviews
     - *Henderson HS*
     - *HK International School*
     - *WCU*
     - *HK University of Science & Tech*
Using CE to Improve *Ecology* Education for Secondary Students

1. **US/Hong Kong Exchange - June 2012**
   - Compare & share with teachers/teacher-prep faculty
     - Perceptions of eco-education coverage (higher & sec ed)
     - Eco-oriented curricula (higher & sec ed)
     - Content/skills/global issues standards (sec ed)
     - Pedagogical/best teaching practices (higher & sec ed)
     - Exemplary unit plans/projects (sec ed)
   - Incorporate findings into teacher-prep courses & share with biology teachers for use of *select* best practices
   - Reflect with teacher-prep candidates/teachers on implementation
   - Establish teacher-prep student exchange - *Future?*
Using CE to Improve *Ecology* Education for Secondary Students

2. US/? Exchange - *Future?*

- Compare & share with teachers/teacher-prep faculty
  - Perceptions of ecology education coverage (higher & sec ed)
  - Eco-oriented curricula (higher & sec ed)
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