

The SFU logo is a red square with the white letters 'SFU' inside.

FACULTY OF ENVIRONMENT

Interpreting Interdisciplinarity in Environmental Education: a Canadian Case Study

The background image shows a large, modern university building with a prominent concrete overhang supported by columns. In the foreground, there is a paved walkway, a grassy area, and a rectangular pond with a small fountain. A few people are visible walking on the grass and near the pond.

CCUEN Halifax 2016

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Professor and Dean

Plan for Today

1. What inspired this research
2. The Current SSHRC-funded Research Project
3. Discussion

1. What inspired this research

- Long history of interdisciplinarity
- Undergraduate and Graduate Planning: UofT and SFU
- ES and EnvSc (science as *recht*)



Back to the 70s:!

Eric Jantsch and the OECD:

- **Multidisciplinary:** juxtaposition with no apparent connection
- **Pluridisciplinary:** juxtaposition of similar disciplines (math + physics)
- **Interdisciplinary:** interaction between disciplines
- **Transdisciplinary:** a common system of axioms

World's 1st intergovernmental conference on EE
(organized by UNESCO and UNEP)

1977 Tbilisi Declaration:

Environmental Education → Interdisciplinary

“not just an extra subject to be added on to the existing curriculum.”



3. The Current SSHRC-funded Research

- Universities/units update inventory
- Survey of key university environmental leaders
(to 100 people with >30% response rate)
- Qualitative, Hermeneutic Investigation of curriculum shifts
- Interviews
- Industry survey



Key Questions

- Any relevant paradigm shifts?
- What constitutes interdisciplinary rigour (depth vs. breadth)?
- Role of *praxis*?
- Guidelines for program delivery?
- Match industry needs?

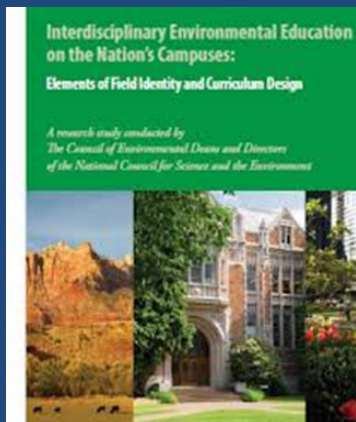
Analyzing CDN Universities

	Of a total of 149 units
Colleges	1% or 2 units
Faculties	6% or 9 units
Schools	10% or 15 units
Departments	20% or 30 units
Institutes	26% or 39 units
Centres	36% or 54 units

USA Comparison: Council of Environmental Deans and Directors (CEDDD)

Of all IE degrees:

- Almost all contain “sustainability” concepts
- 44% named Environmental Science
- 25% named Environmental Studies
- 31% other (Sustainability; Natural Resource; Management; Urban and Environmental Policy etc.)



Analyzing CDN Universities List

Percentages of total unit names	Of a total of 149 units	Notes
containing the word 'science' or 'sciences'	19% or 28 units	
containing 'environmental studies'	11% or 16 units	
containing 'sustainable' or 'sustainability'	19% or 28 units	French was translated as 'durable' or 'durabilité'
containing 'environmental management'	2% or 3	
containing 'management'	5% or 8 units	e.g. 'resource management' or 'coastal management'

CEDD ideal models: from least to most popular

- 1. Systems Science** (Earth Sciences; Biology etc.; analytical/diagnostic: **22%** of IE)
- 2. Policy and Governance** (social sciences, humanities and public engagement; awareness and behavior change: **33%** of IE)
- 3. Adaptive Management** (coupled human-nature systems knowledge, problem-solving and solutions-oriented; meta-expert sustainability-oriented management: **45%** of IE)

Survey of CDN Environmental Leaders

From least to most popular (with caveat!)

- Systems Science
- Policy and Governance
- Adaptive Management

“All 3 are part of an integrated approach....”

Survey Results

2-3 keywords describing the fields

- “management”, “adaptive management”
- “policy”
- “systems”
- “interdisciplinary” most prevalent

Survey Results

- Almost 65% of respondents said that “interdisciplinarity” has changed over the decades
- 30% weren’t sure
- Around 5-6% felt that it had not changed at all.

Survey Results:

How has meaning of interdisciplinarity changed?

- “Range of fields has exploded...”
- “Natural sciences have gradually got on board”
- Less multidisciplinary and more “synergy”
- Greater appreciation of need for interdisciplinary collaboration on complex problems of global scale
- More problem and governance-focused

Interviews

- Still under analysis
- Some interesting findings:
 - 3 keywords for EnvSc and ES: Interdisciplinarity
 - “Environmental Studies”:
 - Broader theme containing EnvSc; or
 - Humanities, social policy, “no job market”

Interviews

- Professional Organizations:
 - Negative comments about ESAC: “ESAC has always been a problem.”
 - CCUEN: “...definitely shares information but I have yet to see anything that helps us in our programming....”

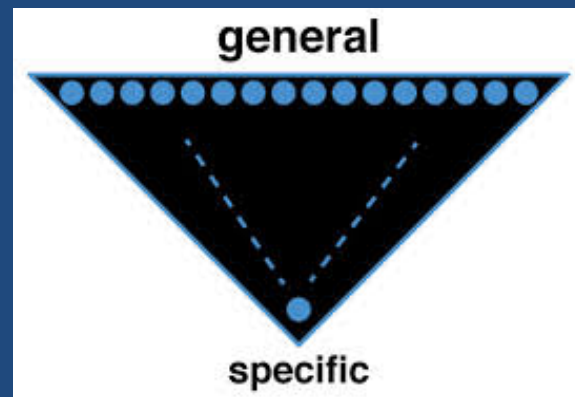
Interviews

- Curriculum:
 - Overall shift from theoretical to applied
 - Greater focus on tools
 - More complexity in programming (will say more)
 - Differing views on whether interdisciplinarity should occur at undergrad or grad level

Qualitative, Hermeneutic Analysis of Curriculum

Maturation of approaches. For example:

- Environmental Planning and Design (1970)
- Recreation Planning and Management (1988)
- Landscape Ecology in Planning; Land Use Planning; Community Planning and Housing; Politics and Planning; GIS Applications in planning; Recreation and Tourism Planning and Management (2009)



Hermeneutic Analysis

A shift from broad, interdisciplinary courses to offerings that emphasize applied, practical *value; problems-focused.*



New perspectives and approaches

Significant Course Increases over the decades

Risk

Sustainable Development

International focus

Ecology

**Environmental Impact
Assessment**

Ethics, Justice, Culture

Gender

Hydrology

Policy and Governance

Word Frequency Change between 1979 and 2009: top 20/100 words analyzed

Word, Cluster, or Phrase - Absolute Largest Change	Change in % Coverage	Word, Cluster, or Phrase - Absolute Smallest Change	Change in % Coverage
international, global, world	0.51	planning	-0.57
sustainability, sustainable	0.49	energy	-0.18
risk, safety, security	0.28	regional	-0.08
ecology, -ical, ecosystem	0.23	institutions	-0.06
risk	0.21	Law, legal, legislation	-0.06
culture	0.17	attitudes, behaviour, behavioural, behaviourism	-0.06
ethics, justice, values, morals, morality, equity, equality	0.16	legal,	-0.05
Community, Society, People	0.16	housing	-0.04
Sustainable development	0.15	pollution	-0.03
cultural, culture	0.14	law	-0.03
political, politics	0.14	interventions	-0.03
integrated, interaction, interdependence, interdisciplinary, interrelationship, intersection	0.11	conservation	-0.03
Resource management	0.11	theory	-0.03
history -ian, -ical	0.11	impact assessment	-0.02
women, gender, feminist, - ism	0.1	resource(s)	-0.01
aboriginal, First Nations, Indigenous	0.08	policy	-0.01
justice	0.07	design	-0.01
conflict, dispute, mediation, resolution	0.07	power	-0.01
ethics, -al	0.07		
health	0.06		

Some Reflections to date

- Meaning of “interdisciplinarity” shifts
- Some additional depth, complexity and maturation of issues
- New interdisciplinary fields of study
- More problems-focused than generalized or theoretical

Yet to come...

- Results of industry survey
- Detailed Nvivo analysis of interviews
- Website development



Questions to ponder

- Paradigm shifts: good or bad?
- Professional certification: good or bad?
- Role of *praxis*: how to include in curricula?
- How to create options for students in program planning?
- Role of online learning?
- Other? Discussion?.....

Thank-you! Questions? Discussion?

