Geoethics: Ethical, social and cultural implications of geoscience knowledge, education, research and practice

Thanks

Convener: Silvia Peppoloni
Co-Conveners: Nic Bilham, Martin Bohle, Giuseppe Di Capua, Eduardo Marone

Also: Dennis Meadows, Jim Hansen, Kevin Anderson, Bill McKibben, David Kolb, George Monbiot, Iain Stewart, John Abraham, Mike Mann, Steve Schneider, Dana Nuccitelli, John Crookall, et al

Geothics: Ethical, social, cultural and affective implications of geoscience knowledge, education, experience, research and practice
The ethics of educational methods to teach geoethics

Pimnutcha Promduangsri
Lycée Auguste Renoir, France

David Crookall
Université Côte d’Azur, France
crookall.consulting@gmail.com

Who knows?

Latest CO₂ reading
April 18, 2017
410.28 ppm
Carbon dioxide concentration at Mauna Loa Observatory

Full Record ending April 18, 2017
Why geo-ethics & edu-ethics?
‘cos of geo-catastrophy (not -ies)

PACIFIC SARDINE POPULATION IN COLLAPSE

2006 – 1.8 million metric tons
2017 – 86,000 metric tons

Devastation
Healthy - Dec 2014
Dying - Feb 2015
Dead - Aug 2015
GGOs (Global geo-edu-ethical objectives)

- Longer-term (intergenerational) edu objectives

- Geoethics to be in all courses, at all levels and in all subjects worldwide (intergenerational project)
  - ~90% the world’s pop & orgs to be aware of geo problems (bigger in the long term) & their cause(s)
  - ~60% of the world’s pop & orgs to act ethically / responsibly in regard to those problems

- Shorter-term edu goals

- Devise & use ethical methods, strategies & programmes to reach the longer-term GGOs

*If we advocate geoethics, then we need eduethics to do it*
Geo-edu-ethics

- Responsible geo-ethical behaviour through ethical education
  - Ethical geo-behaviour via edu-ethics

- Geoethics: Achievable only with intergenerational ethical education

- Geoethics-edu: needs → ethical practice doing (not saying)

- Edu content
  - Sustainability, CC, deforestation, limits to growth, pollution, ...

- Edu methods
  - Internships, simulation/games, project work, ...

---

Edu methods (roughly)

- Educational methods
  - Traditional
  - Experiential
    - Simulation (incl models)
    - Real

Traditional ≠ experiential
Methods

Many traditional ways of teaching, e.g.:
- Chalk & talk (lecture);
- Demonstration;
- Tutorial;
- Seminar;
- Discussion;
- Programmed instruction;
- Etc

Learning from experience (growing, but still rare)
- Fabricated (or virtual) events / situations
  - Simulation/gaming, role-play, games, (serious games 😊)
- ‘Real’ experiences / events
  - Project work
  - Field trips
  - Internships
  - Travel
  - Film
  - Confs
  - Research
  - Disasters; Tragedy
  - Everyday life
  - ...

Experiential: Young citizen scientist, Chamonix

"Un seul mot d’ordre : la science participative. Vous collecterez des observations de terrain selon les protocoles établis par nos scientifiques pour compléter les données à disposition de la recherche. Vous serez également associés au traitement et à l’analyse de ces données pour découvrir ou approfondir la démarche scientifique."

http://blog.creamontblanc.org/missions-de-volontariat-a-chamonix-2017/
Objectifs

« Le volontariat scientifique du CREA Mont-Blanc permet ainsi de :
Réunir autour d’un projet commun, à travers un engagement associatif sur leur temps libre, résidents du territoire … et visiteurs de passage.
Faire du débat public sur le changement climatique un questionnement plus tangible pour les volontaires. En s’impliquant directement dans des études participatives, les volontaires observent leur environnement sous un nouvel angle et leur perception de la montagne évolue. »

- Mesure de l’indice de vert de la végétation (sa « productivité »), cruciale lorsque les chamois et autres ongulés mettent bas
- Recherche et mesure de la croissance des arbres les plus hauts pour évaluer la remontée des arbres en altitude
- Analyse de la couverture végétale dans des carrés déterminés
- Aide à l’installation de nouveaux équipements pour des suivi de long-terme
- Analyse de photos de paysage
- Travail d’analyse de données collectées avec un chercheur
- Création de nouveaux protocoles et de modes de visualisation des données »

http://blog.creamontblanc.org/missions-de-volontariat-a-chamonix-2017/

Ethical issues in edu methods

- Ethical issues in experiential geoethical learning events / methods

1. Content (criteria, who chooses, …)

2. Manner in which the event is conducted

   ➔ the effect it has on participants
   (in addition to any supposed learning)

3. Unseen effects
Experiential

- Simulation/gaming, role-play and other experiential learning approaches
  - Rely on providing or creating a (meaningful & memorable) situation or event that the learner experiences first hand (very different from a lecture)
    - "geoethical simulations" because their content focuses on some ethical dilemma related to the earth
  - Ex
    1. A conflict among stakeholders over management of water along a river
    2. Competition among fishers for limited fish stocks (tragedy of the commons)

"Learning by doing"

Ethical pb in using geoethical sim

“Simulations of geoethical problems often generate strong emotions, just like their real-world counterparts. However, asking young people to participate in an emotion-generating event requires it to be done according to ethical principles. In many cases, many such simulations do more harm than good simply because they are not conducted properly.

The simple fact of inviting people to participate in an emotionally challenging situation itself raises ethical issues, and this in turn has ethical implications for the way in which we conduct these kinds of geoethical simulations.” (Abstract)
Key = debriefing properly

- Some simulation/games (esp ‘serious games’) simply not debriefed = irresponsible

- Many edu sims are debriefed. But how?
  - Many ways to debrief
    - Bad ways → harm participants
    - Good ways → help participants learn & understand
  - Thus the manner of debriefing has direct ethical implications

- Also, most experiential events (eg, internships, field trips) are simply not debriefed = irresponsible

Processing experience (Kölbl)

- Concrete Experience
- Reflective Observation
- Abstract Conceptualization
- Active Experimentation

Experiential Learning Cycles

Act
- Concrete Experience
  - Facts (What Happened?)
  - Theory of Action

Apply
- Active Experimentation
  - Futures (What Will I Do?)
- Implement Revised Theory

Reflect
- Reflective Observation
  - Feelings (What Did I Experience?)
  - Assess Behavior & Consequences

Conceptualize
- Abstract Conceptualization
  - Findings (Why Did This Happen?)
  - Revise Theory

Key references:
1. David Kolb
2. Roger Greenaway
3. Chris Argyris & Donald Schon
Two examples

- Sim + debr

- Project IDEALS
  - International Dimension in Education via Active Learning and Simulation
    - ICONS
      - International Communications and Negotiations Simulation

- FISHBANKS
  - Dennis Meadows
    - With new debriefing protocol by DC

Project IDEALS

Promoting an International Dimension in Education via Active Learning and Simulation

Fund for the Improvement of Postsecondary Education (FIPSE), Department of Education, US Federal Government
Project IDEALS - overview

- Teams = Synthetic countries, based on real; + Newspapers, Consultants, Pressure groups

- Last run:
  - 27 participating teams
  - In 12 countries US, DE, HK, AU, CA, RU, JP, ...
  - 800 participants; 40 facilitators

- **Learning** objectives: Learn about the oceans, their resources, the politics, etc.

- **Simulation** goal: Write treaty ~ UNCLOS
  - 3 weeks + 7 weeks + 4 weeks
  - Internet: Before web (telnet); text + teleconfs
    - First time internet used in France for edu
    - First time interactive Internet connection between USSR and USA

1: Participating teams

- 27 teams
- 12 countries
- 800 participants
- 40 facilitators
2b: Simulation/game: **Objective**

- Negotiate the terms of a treaty governing the use and management of the oceans’ resources
- Compose the detailed text of that treaty

**Treaty**

Whereas humanity must live in peace;  
Whereas resources are limited;  
**Article 1: Seabed**  
**Article 2: Territorial sea**  
**Article 3: Innocent passage**  
**Article 4: Whaling**  
**Article 5: Fishing**  
**Article 6: The agency**  
**Article 7: ...**

Uncanny resemblance with the real UNCLOS treaty

**Stages - Overview**

**Semester-long sim:**
1. **Preparation** - 3-5 weeks
2. **Simulation** - 7-8 weeks
3. **Follow-up** - 2-4 weeks
Stage 3 - Follow-up 2-4 weeks)

- Formal & informal debriefing
- Analysis of messages
- Visits; Pen pals
- Interviews with press
- Writing (essays, posters, leaflets)
- Evaluation (on-line questionnaire)
- ...

Exchange between 2 students in a debriefing session:

- One student paces up and down.
- Another student asks "Why do you walk up and down like that?"
- The first answers: "Because I can think on my feet".
- The other then wonders: "But how do you manage in your other classes, then?".
- The first says: "I get bored, not think".

FISH BANKS, Dennis Meadows
Underlying systems dynamic model

Actions / round

Participant groups = fishing companies

Computer calculates results

Participant variables = Decisions each round
Compare. Tragedy of the Commons

Masters students
- 2014, France
- No knowledge of sustainability
- No interest in fish or fishing

Professionals
- 2015, Thailand
- Fishing authorities
- Great interest in sustainable fishing stocks

Neither know Tragedy of the Commons (Problem with Open Access)

Evolution of catch and regeneration

Tot catch, Deep sea
- New fish, Deep sea
- Tot catch, Coast
- New fish, Coast

FISBANKS, SEDIKISEM, M2, 2014

Evolution of indices for fish, ships & catch

Ships
- Catch
- Fish

Compare.
Debriefing

- Steps
  - A
  - B
  - C

- Structured
  - 1
  - 2
  - 3
  - 4
  - D
  - E
  - ...

- Individual
- Group
- Intergroup comparison
- PPT

- Home / class
- Literature
- Report
- Portfolio

- Repeat
Debriefing form (c) 2013 by David Crookall, for FISH BANKS, by Denis Meadows

Name: ________________________ Fishing company: _______ Role: _______ Date: __________

Travaillez seul(e) et en silence. Rappel: You are no longer in the simulation. Think back to your time in the simulation. Inscrire que mots & phrases clé(e)s (pas de longues phrases).

1. Quels état(s) / sont vos différents sentiments / émotions?
   a. pendant l’activité (excité, frustré, content, énerve, d'accomplissement, d’appartenance)?

   b. maintenant?

2. Que? Here just describe, do not explain or interpret. Qu’est ce qui s’est passé pendant l’activité? Do not try to explain or interpret here; be descriptive. Consider: Facts, events, interactions, decision processes. Teamwork in your company (clarity of objectives, role clarity, balance, responsibility, listening, etc). Ship allocation strategies used. Your company’s achievements. Evolution of the fish stocks. Ship acquisition (purchase, trade, auction). Account keeping. Negotiation with other companies. Trust levels.

3. How well do you feel your company succeeded in the negotiations? How well do you feel the other companies succeeded?

4. A votre avis, pourquoi? Raisons & explications des événements en N°2 et succès ou échecs en N°3. What factors encouraged success? What factors made things difficult? For example: How did emotions influence events? Did communication problems influence events? How did negotiations influence outcomes? What was the role of greed (the desire to become rich, the desire to become richer than others - to ‘win’ at all costs), and non-concern for next generations.

Individual form filled out (start)
“Companies want to make ... the most money without considering our environment.”

“The world of tomorrow is put in peril because of irresponsible industry.”

18. Real word. What analogies can you make with the real world? What other natural resource commons are being plundered in this way? What kinds of overshoot & collapse are we witnessing today (overshoot-using resources faster than they can regenerate, going beyond the limits of sustainability). (examples: trees, alcohol, urbanization, debt, water, soil, etc).

What about tomorrow? What are the main dangers in your lifetime?

Communication entre les entreprises afin de trouver une solution commune pour le bien de tous car dans le monde réel, cela se passe comme ça, toutes les entreprises veulent faire des bénéfices et gagner le maximum d’argent sans prendre considération de notre environnement. Les actes des entreprises touchent bien les autres entreprises concurrentes mais aussi la population. Il faut que les consommateurs manifestent des dangers causés par les entreprises. Le monde de demain est mis en péril à cause de ses industriels irresponsables.

“We realized that each decision must be thought through carefully and that, to save our planet, the most important thing is to communicate.”

22. Your future. In what ways will this simulation experience and especially your heightened awareness of the issues, influence your future Outlook and your future career?

Cela nous permet d’être plus sensible sur la question de respect de l’environnement ! On a pris conscience que chaque décision prise doit êtreurement réfléchie et que pour sauver notre planète, la première chose à faire c’est de communiquer. Tous ceux qui ne respectent pas les accords doivent être sanctionné.

Etant donné que nous serons bientôt inséré dans le monde professionnel, il faut qu’on se mobilise et qu’on intègre cette problématique concernant l’environnement à nos choix et décisions.
Debrief at Sciences Po (IEP)

“I feel so ashamed of myself, of what I have done; this experience will be a lesson for me for the rest of my life and my career”

4th Global Ethics Day, 18 Oct, 2017

Suggestion for IAPG (at EGU)

Add ?

**Emotion & experience** → drive people

New title ?

Geoethics: **Ethical**, social, cultural and **affective** implications of geoscience knowledge, **education**, **experience**, research and practice

Thank you
Qs?