EGU – EOS 14 - EGU2017-5668

- 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**

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

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The ethics of educational methods to teach geoethics

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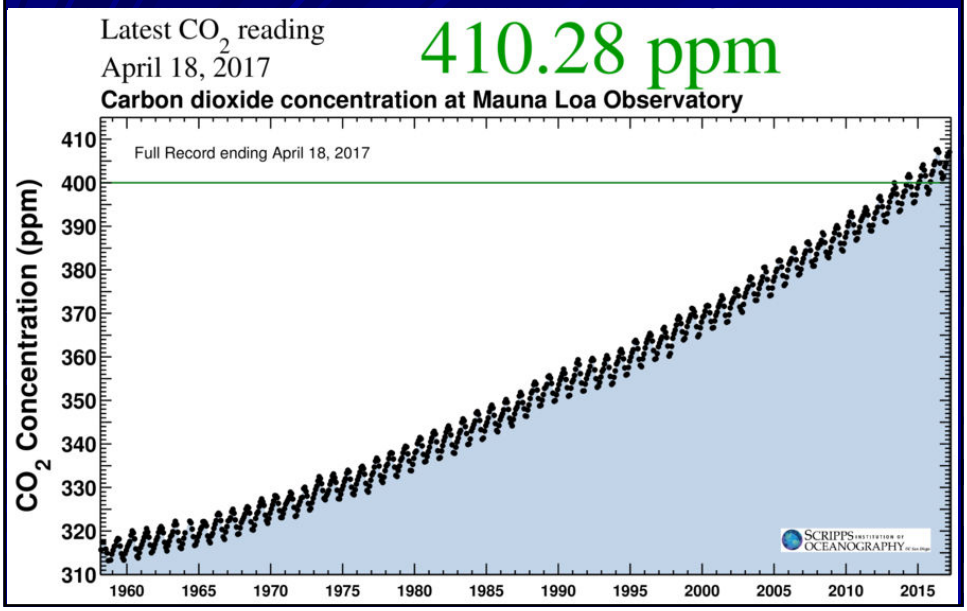
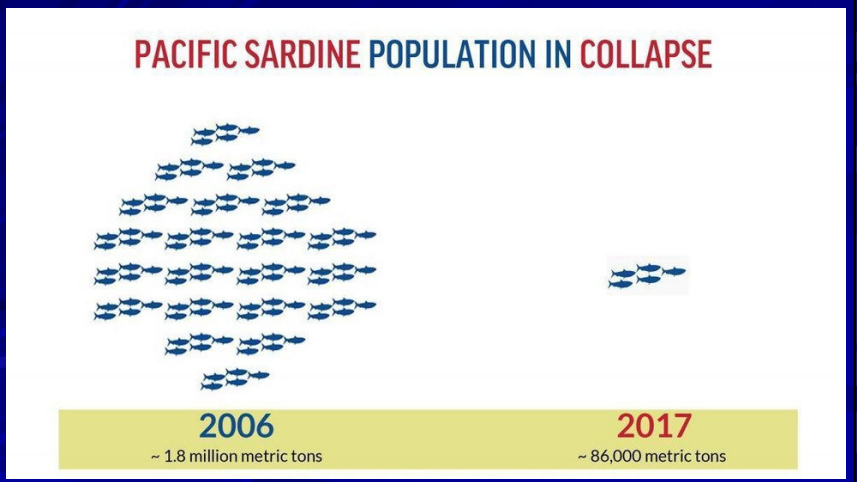
Who knows ?

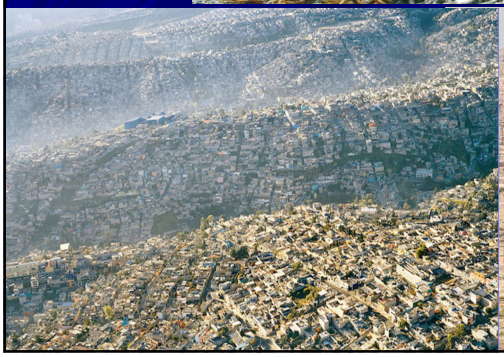


Why geo-ethics & edu-ethics?

'cos of geo-catastrophy (not -ies)



Devastation



The Muir Glacier, 1941:

The Muir Glacier, 2004:

Source: Bruce Molnia, U.S. Geological Survey, 2004

UPSALA GLACIER (ARGENTINA), 1928

UPSALA GLACIER (ARGENTINA), 2004

US Coast Guard photo of Mantolokingm New Jersey, after Hurricane Sandy (public domain, courtesy use)

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** **do**ing (not saying)
  - Edu content
    - Sustainability, CC, deforestat°, limits to growth, pollution, **…**
  - Edu **methods**
    - Internships, simulation/games, project work, …

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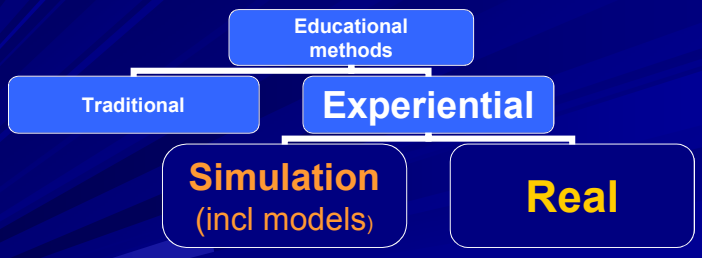
Edu methods (roughly)



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 :

Rassembler plus de **données** sur la faune et la flore du Mont-Blanc. Ces données permettront de **mieux connaitre** le massif et son fonctionnement pour déterminer quelles seront ses **évolutions** d'ici 2100.

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 suivis 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.

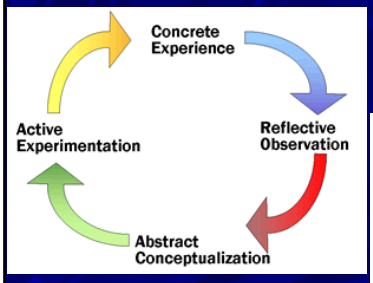
However, asking young people to participate in an emotion-generating event requires it to be done according to **ethical principles**. In many cases, many such simulations do **more harm than good** simply because they are **not conducted properly**.

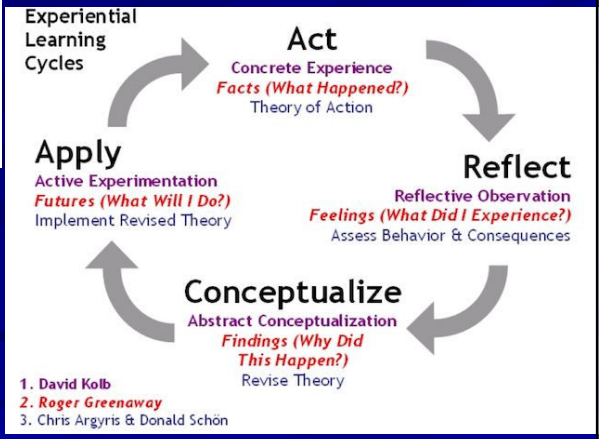
The simple fact of inviting people to participate in an emotionally challenging situation itself raises ethical issues, and this in turn has **ethical implications** for the **way in which we conduct** these kinds of **geoethical simulations**." (Abstract)

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 (Kolb)



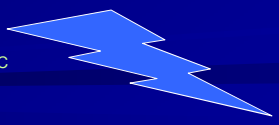


Two examples

- 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

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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

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1: Participating teams

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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

- Uncanny resemblance with the real UNCLOS treaty

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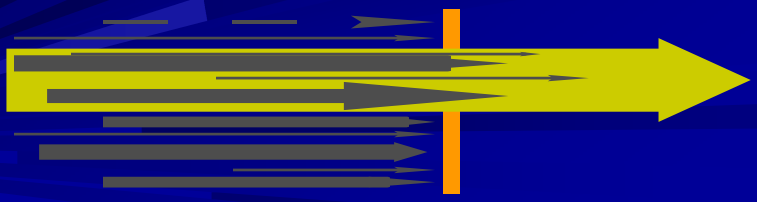
Stages - Overview

Semester-long sim:

1. Preparation - 3-5 weeks
2. Simulation - 7-8 weeks
3. Follow-up - 2-4 weeks



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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)
- …

Brown Uni incident during one run

- Exchange between 2 students in a debriefing session:
  - One students 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*".

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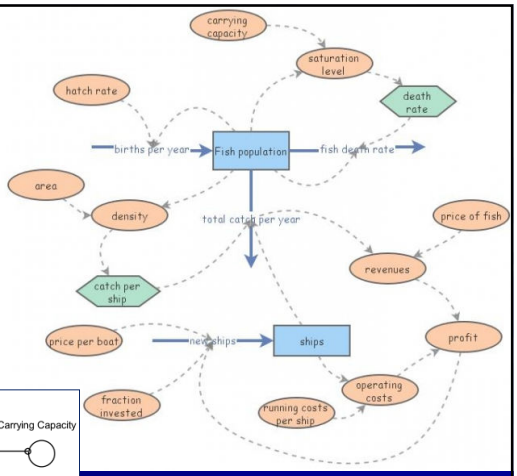
FISH BANKS, Dennis Meadows

Underlying systems dynamic model



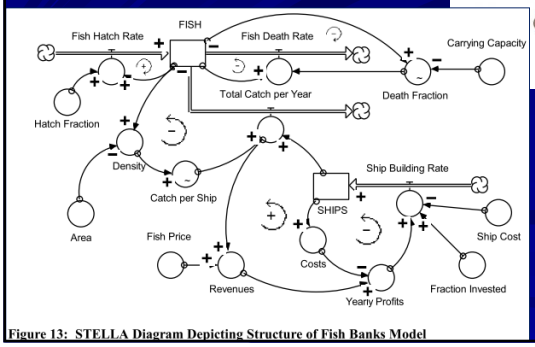


Figure 13: STELLA Diagram Depicting Structure of Fish Banks Model

Actions / round

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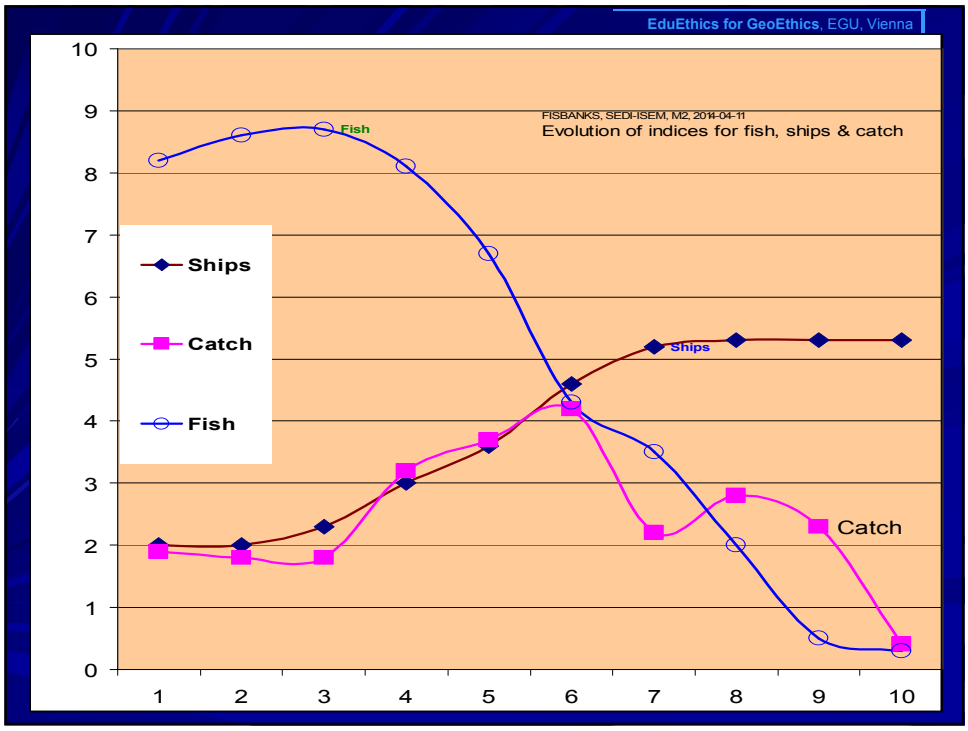
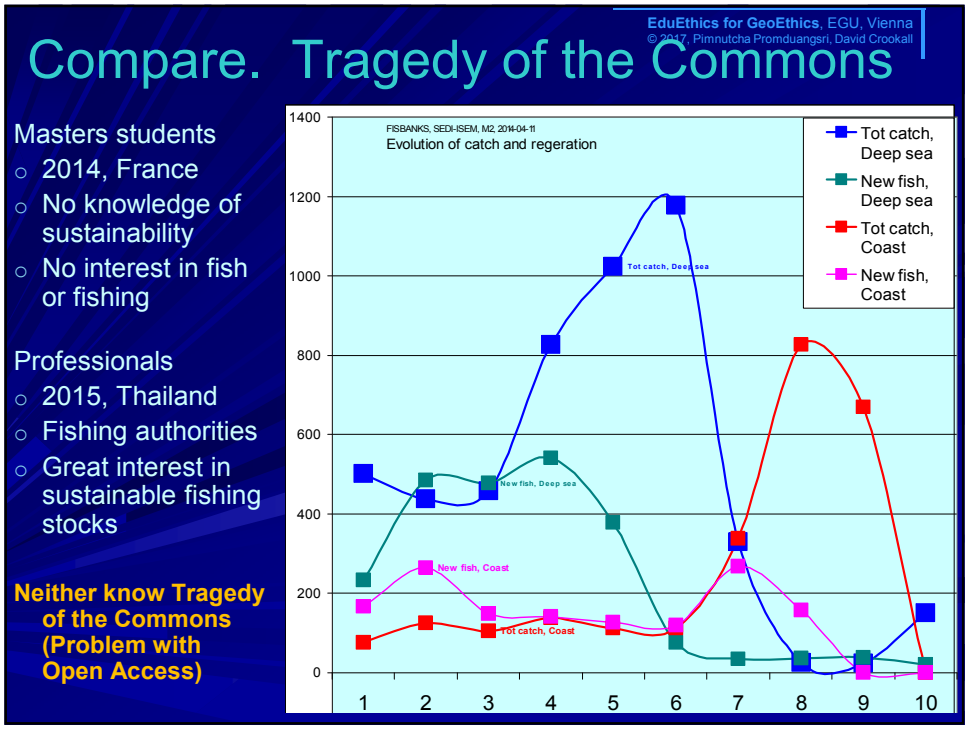
Participant groups = fishing companies

Computer calculates results

Participant variables = Decisions each round

Annual Report	Year	1	2	3
R:1	Deep Sea Catch (# fish last year)			
R:2	Coast Catch (# fish last year)			
R:3	Price of Fish ($ / fish last year)			
R:4	Total Fish Sales ((R:1 + R:2) x R:3)			
R:5	Interest ($ last year)			
R:6	Initial Bank Balance ($ this year)			
R:7	Ship Fleet Before Auctions and Trades			
Change Number of Ships	**Year**	1	2	3
D:1	Ships Purchased in Auction			
D:2	Money Spent on Auction			
D:3	Ships Purchased in Trade			
D:4	Money Spent on Purchases			
D:5	Ships Sold in Trade			
D:6	Money Received from Sales			
D:7	New Ships Ordered			
Allocate Ships	**Year**	1	2	3
D:8	Ship Fleet after Auctions & Trades			
D:9	Ships Sent to Deep Sea			
D:10	Ships Sent to Coast			
D:11	Ships Remaining in Harbor			


EduEthics for GeoEthics, EGU, Vienna
FISBANKS, SEDI-ISEM, M2, 2014-04-11
Evolution of indices for fish, ships & catch
Ships
Catch
Fish
Fish
Ships
Catch
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10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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)
FISBANKS, SEDI-ISEM, M2, 2014-04-11
Evolution of catch and regeration
Tot catch, Deep sea
New fish, Deep sea
Tot catch, Coast
New fish, Coast
Tot catch, Deep sea
New fish, Deep sea
New fish, Coast
Tot catch, Coast
1400
1200
1000
800
600
400
200
0
1
2
3
4
5
6
7
8
9
10

Specialists in fisheries & sustainability

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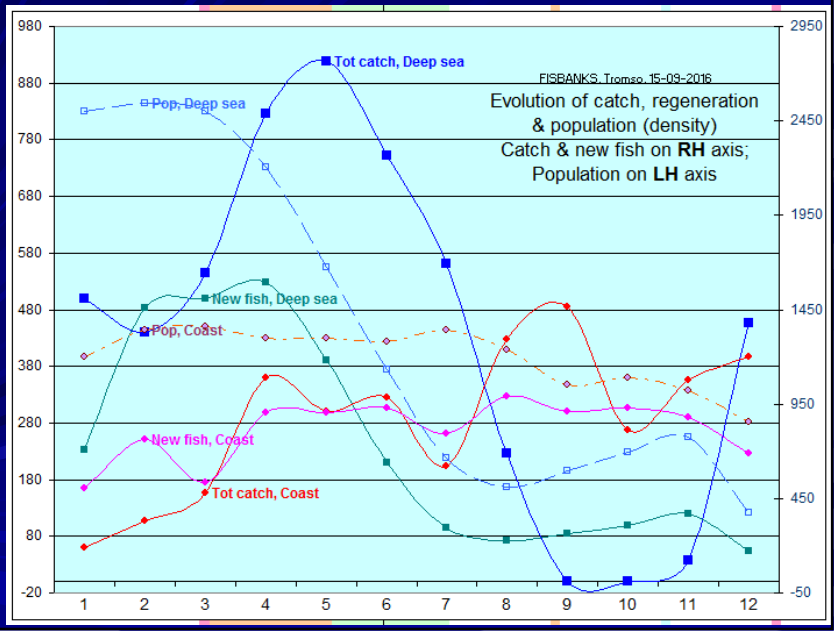
U of Tromso, Norway



Debriefing

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- Steps
  - A
  - B
  - C
  - Structured
    - 1
    - 2
    - 3
    - 4
  - D
  - E
  - …
- Individual
- Group
- Intergroup comparison
- PPT
  - Home / class
- Literature
- Report
- Portfolio
- Repeat

Debrief

Individual form:

(start)

Individual debriefing form (c) 2013 by David Crookall, for FISH BANKS, by Dennis 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. Inscrivez qqs mots & phrases clefs (pas de longues phrases).

1. Quels étaient / sont vos différents **sentiments** / émotions?
   a. **pendant** l'activité (excité, frustré, content, énervé, d'accomplissement, d'appartenance)?

   b. **maintenant**?

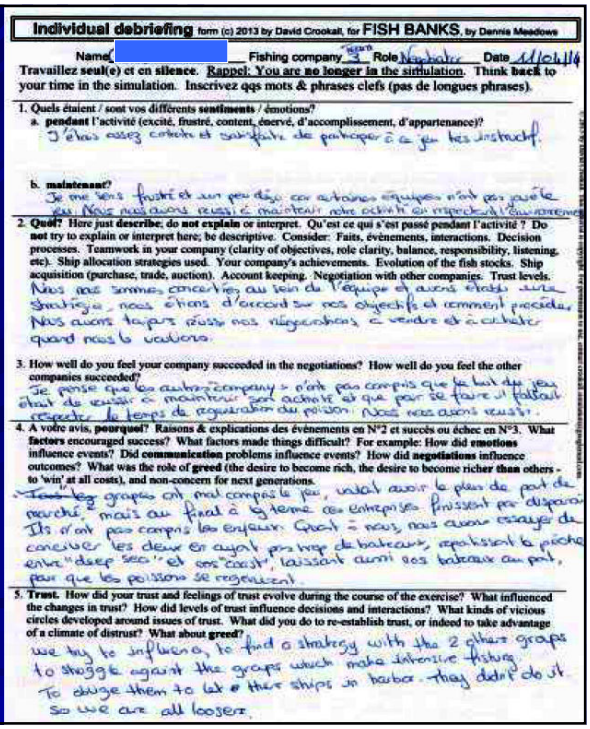
2. **Quoi?** Here just **describe**; do **not explain** or interpret. Qu'est ce qui s'est passé pendant l'activité ? Do **not** try to explain or interpret here; be descriptive. Consider: Faits, évènements, interactions. Decision processes. Teamwork in your company (clarity of objectives, role clarity, 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 évènements en N°2 et succès ou échec 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 rich**er than** others - to 'win' at all costs), and non-concern for next generations.

- Individual form filled out

(start)



Individual debriefing form (c) 2013 by David Crookall, for FISH BANKS, by Dennis Meadows

Name[redacted] Fishing company 3 Role Navigator Date 11/04/14

Travaillez **seul(e)** et en **silence**. Rappel: You are **no longer in** the simulation. Think **back** to your time in the simulation. Inscrivez qqs mots & phrases clefs (pas de longues phrases).

1. Quels étaient / sont vos différents **sentiments** / émotions?
   a. **pendant** l'activité (excité, frustré, content, énervé, d'accomplissement, d'appartenance)?
   J'étais assez content et satisfait de pouvoir à la fin tes instructions.

   b. **maintenant**?
   Je me sens frustré et un peu déçu car certaines équipes n'ont pas joué le jeu. Nous nous avons réussi à maintenir notre activité et respecter l'environnement

2. **Quoi?** 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: Faits, évènements, 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.
   Nous nous sommes concertés au sein de l'équipe et avons établi une stratégie, nous étions d'accord sur nos objectifs et comment procéder. Nous avons toujours réussi nos négociations à vendre et à acheter quand nous le voulions.

3. How well do you feel your company succeeded in the negotiations? How well do you feel the other companies succeeded?
   Je pense que les autres company n'ont pas compris que le but du jeu était de réussir à maintenir son activité et que pour se faire il fallait respecter le temps de régénération du poisson. Nous nous avons réussi.

4. A votre avis, **pourquoi**? Raisons & explications des évènements en N°2 et succès ou échec 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 rich**er than** others - to 'win' at all costs), and non-concern for next generations.
   Les groupes ont mal compris le jeu, voilà avoir le plus de part de marché, mais au final à terme ces entreprises finissent par disparaître. Ils n'ont pas compris les enjeux. Quant à nous, nous avons essayé de conserver les deux en ayant pas trop de bateaux, repartissant la pêche entre "deep sea" et "coast", laissant aussi nos bateaux au port, pour que les poissons se régénèrent.

5. **Trust.** How did your trust and feelings of trust evolve during the course of the exercise? What influenced the changes in trust? How did levels of trust influence decisions and interactions? What kinds of vicious circles developed around issues of trust. What did you do to re-establish trust, or indeed to take advantage of a climate of distrust? What about **greed**?
   We try to influence, to find a strategy with the 2 others groups to struggle against the groups which make intensive fishing. To divide them to let their ships in harbor. They didn't do it. So we are all loosers.

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"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 wih 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.

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"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 expérience 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 être murement 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

https://www.carnegiecouncil.org/news/announcements/439

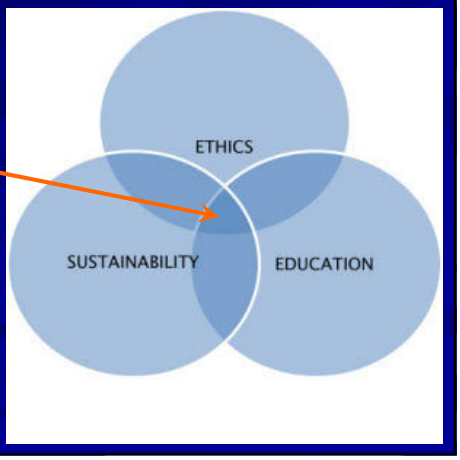
Suggestion for IAPG (at EGU)

Add ?

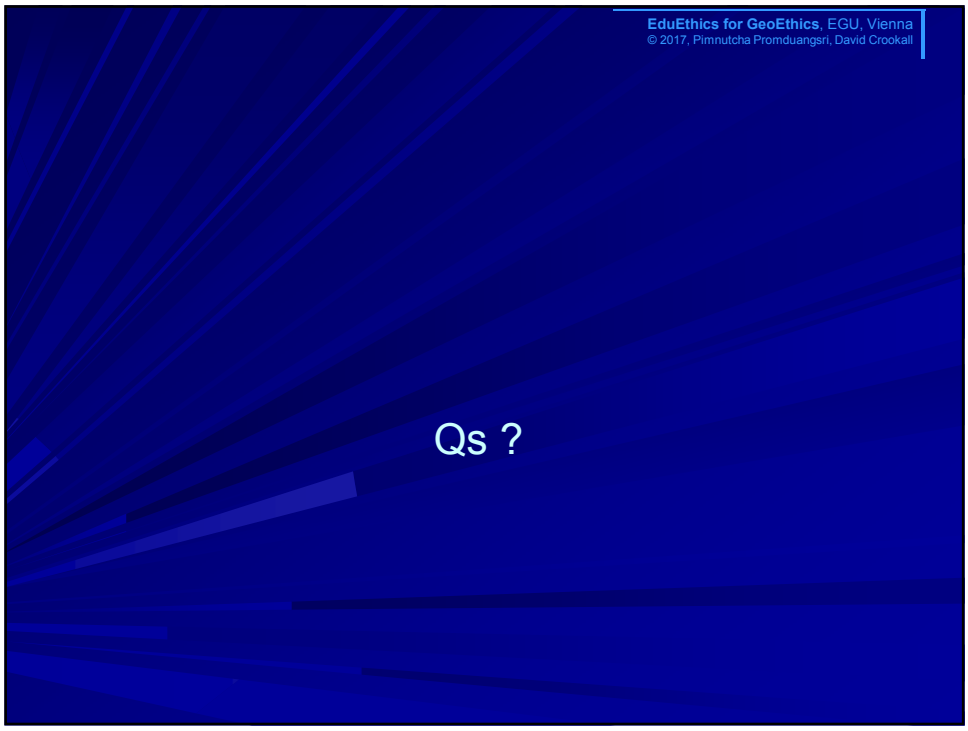
Emotion & **experience**
→ drive people

New title ?

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



Thank you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Qs ?