

**CILS Science Fellows-Cohort 1
Advanced Seminar**

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Spring 2004
Classroom Unit, 201
Tuesdays 2:00-4:00

The focus of this second year seminar is to provide further theoretical perspectives in science learning research and communication in different environments. Supporting these perspectives, the readings, presentations, fields trips and case studies offer different methods to consider in preparation of your third year project. Additionally, the topics covered are intended to provide further material in relation to work as and with educators in different learning environments.

There are two written assignments:

- Observations and assessment paper - 3 page paper, *due May 25th*
- Third Year Project Design and Assessment Proposal - 7 page paper, *due June 1st*

Observation Paper

During the week of May 17th, select an informal learning site (e.g. the Exploratorium, San Jose Children's Discovery Museum, Seymour Discovery Center, Monterey Bay Aquarium, an after-school institution, a voluntary youth organization) to make observations of the individual visitors, the companions or other visitors they interact with, and the museum environment. Make brief notes on your observations. Then record different questions you have about the visitor's interactions and ways in which you might evaluate the experiences and engagement with the activity or exhibit. If possible select an activity or exhibit to observe that has connections to ideas you have for your third year project proposal.

CfAO Workshop people carry out this same assignment through selecting one of the CfAO inquiry activities and then as a participant observer note the activity, questions you have and possible ways to evaluate the experience.

Third Year Project Proposal

This paper should provide a rationale, description, discussion, assessment ideas and time outline of the science learning/communication project you are considering for your Third Year Project. Although this is only a proposal please try to test out your idea, however minimally, ideally with the intended audience. A discussion section of this paper should describe the results of this trial. This proposal should also discuss assessment methods

you would use and possible ways to make desired changes based on what you learn from your assessments. If you intend to build a prototype of your idea, please also include a written version of your rationale, discussion and assessment plan.

Seminar Evaluation

Seminars are a mix of presentations and discussions. You are expected to read all of the assigned texts and come to each session prepared to discuss the ideas. Please create a brief one page notation/outline of key ideas and questions you have for each assigned article. These will be for you to use in the discussions. Also Sally will collect these as a reference on the perspectives generated by the readings.

Evaluation:

50% seminar participation

20% observation paper

30% third year project prospectus

Seminar Topics and Schedule

I. Ways of Thinking About Science and Learning

3/30 - What counts as science/ kinds of science we want to teach

Marc Mangel essay – *Finding the solution isn't the problem, finding the problem is the problem*, in class reading and discussion

Assignment for next seminar:

- Osborne Delta Study, reader pg 367
- *How People Learn*, Chapters 1 & 2
- Seven principles of learning, reader pg 22

4/5 - Different kinds of learning at the Exploratorium

Note: seminar meets on Monday this week with Ed 286 class

Assignment for next seminar:

- Semper , R. TBA
- Brown, A et.al. (1992) Design Experiments, *Journal of the Learning Sciences*, hand out
- Duensing,S (2000)...Learning in Informal Science Centers *Journal of Human Development Journal*-hand out

II. Learning and Design Methods

4/13 - Environment and technology design considerations in of science learning

Guest Speaker: Rob Semper, Executive Associate Director, the Exploratorium

Assignment for next seminar:

- Ash, D&Klein K. (1999) Inquiry in the Informal Learning Environment, pg 113
- Minstrell,J (1999) Implications for Teaching & Learning Inquiry, pg 157
- Rankin, L.(2000) Lessons Learned....IFI Inquiry chapter , pg 172

4/19 - Inquiry Workshop at the Exploratorium

Note: seminar meets on Monday this week with Ed 286 class

Assignment for next seminar:

- Rennie, L, et.al.(2003) Toward an Agenda for Advancing Research on Science Learning in Out of School Settings, *JRST*-hand out
- Black, P. et.al. (2002) Working Inside the Black box-hand out
- Harlen,W. Enhancing Inquiry Through Formative Assessment-pdf file:
www.exploratorium.edu/ifi/resources/classroom/inventory/density.html
- How People Learn*, Chapter 6

III. Research/Evaluating/Assessing Learning

4/27 - Assessment Overview

Guest Speaker: Candice Brown, IFI Exploratorium(tentative)

Assignment for next seminar: diversity pieces

- Claude Steele lecture transcript/tape
- Ash, TBA
- Rogoff et.al. (1993) Guided participation in Cultural Activity... *SRCD*- hand out
- Crowley, Callanan, et.al. (2001) Parents Explain More Often to Boys than to Girls During Shared Scientific Thinking, *Psych Sci.*, pg 526
- Carol Lee, (2003) *Education Research AERA* – hand out

5/4 - Studying Inclusion and Differences

Guest Speaker: Doris Ash, Assist. Prof. Sci. Ed. UCSC, linguistic inclusion and learning

Assignment for next seminar:

- Moschkovich,J (2003) *Everyday and Academic Mathematics in the Classroom*-hand out
- Callanan, Jipson & Soennichsen (2002)Maps, Globes and Videos...*Perspectives on Object-Centered learning in Museums*, Paris, Ed. LEA –hand out
- *How People Learn*, Chapter 3

IV. Design and Assessment: mixing research and practice

5/11 Case Study: Math 11A Learning issues and ideas revealed by Marc's Math Class. Discussion Session with Marc Mangel and Judit Moschkovich, Associate Professor, Math & Sci Ed, UCSC

Assignment: begin Third Year Project proposal work

5/18 No Class – Individual Observation Project Work or CfAO Inquiry Workshop

Assignment readings:

Journal of Museum Education,(1998) Vol 23 – hand out

5/ 25 - Case Study: San Jose Children's Museum and UCSC researchers

Mixing exhibit design and development with learning research. A discussion with UCSC researchers and Children's Museum developers.

Note: If everyone can make it we would like to hold this seminar on Thursday, May 27th at the Children's Museum.

Assignment: complete Third Year Project proposal

6/1 & 6/8 - Project Proposal Presentations

Project proposals will be presented to and discussed by the whole group the last week of the quarter at a longer seminar session. Exact date TBD.