# Introductory Geoscience Exercises in a Collaborative Learning Studio

DEPARTMENT OF GEOGRAPHY
INDIANA UNIVERSITY

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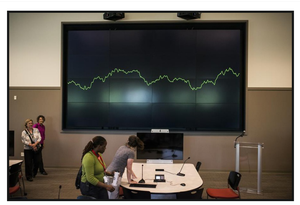
## 1. Introduction

- The Collaborative Learning Studio is an innovative classroom space that utilizes new classroom technology to facilitate active learning approaches including: team-based learning, problem-based learning, and interactive discussions.
- Students can work as teams at up to sixteen tables (total capacity of 96 students) each equipped with software-rich computers with 42 inch monitors, HDMI connectors for laptops, push-to-talk microphones and with enough space to actively work on projects.
- A 20-foot wide video wall at the head of the classroom is controlled by one of three central panels and a 'floating' PC station - it can also be used for sharing by projecting one of the 16 table's screen; or a mosaic of four of all sixteen tables.
- In addition, two projectors can display content on the sides of the room.
- Emphasis is on a de-centered classroom to debunk traditional lecture formats.

## 2. Application: Global Environmental Change

- A 100-level Gen Ed course aimed to introduce non-majors to environmental issues with an emphasis on interactions between human and physical environments.
- The main focus of the course is to introduce students to the complexity of social systems, sensitivity of ecosystems and the challenges to address and plan for modern environmental change.
- Each week focuses on a major environmental change process and include topics such as: tropical deforestation, desertification, coastal issues, food production, waste management, dams, rivers, wetlands, soil erosion and natural hazards.
- Common threads in all topics pervade the whole semester; these include the use of data from observations and models, the consideration of multiple scales of change (temporal and spatial), the interaction of human behaviors and choices with natural systems, and the linkages among aspects of global change science.
- The course is taught in a state-of-the-art active learning environment room with emphasis placed on exercises provided in class supported by brief introductions.
- Course design is the key difference from other courses with exercises given every class that take the majority of the in-class time using various levels of technology.
- Although different software is used, no previous experience is expected/assumed.

## 3. Course Objectives

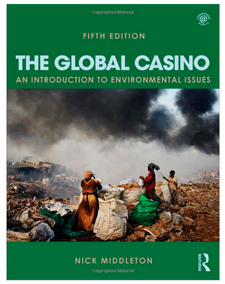


With the completion of the course, students will:

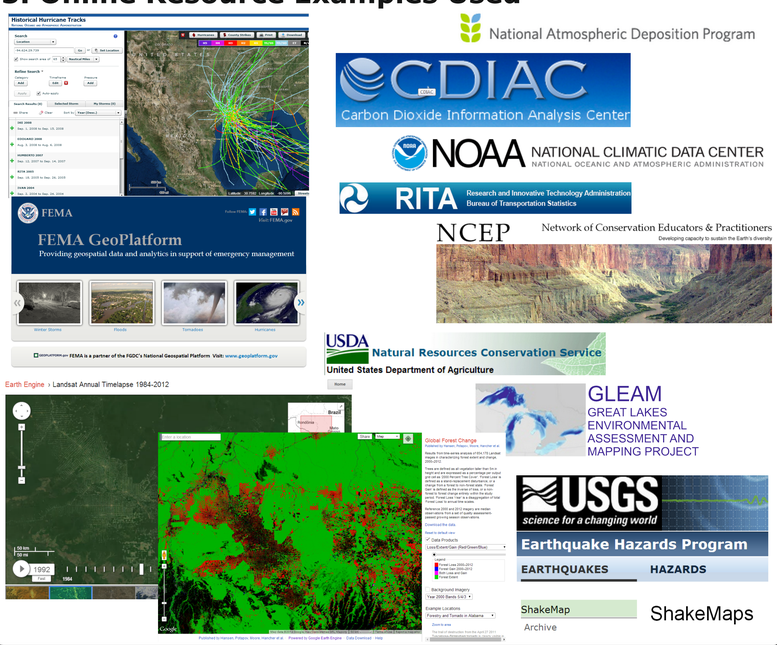
- Explain basic concepts and principles of environmental change.
- Be competent in analyzing the relationships between the physical and human environment.
- Understand and be able to apply the concept of sustainable development.
- Differentiate natural and human-perturbed climatic change
- Critically discuss the impact of humans on biological resources from the oceans, coastal areas, forests, rivers, lakes and wetlands.
- Apply the analytical skills learned from this course to dissect complex conservation and resource management problems.
- Distinguish viewpoints on biodiversity conservation.
- Enhance their ability of critical thinking and learn how to effectively synthesize information from national databases and public sources.
- Efficiently use software programs such as Microsoft Word/Powerpoint/Excel, ESRI Arc GIS Geoplatform, Google Earth and Wordpress/HTML5.

## 4. Course Design

- "The Global Casino: An Introduction to Environmental Issues" is used to provide the essential background information for each topic covered during in-class time.
- This text covers an international environmental issue in each chapter with case studies and historical background.
- One exercise each week was submitted from each table for grading totaling 60% of each student's final mark.
- All assignments were completed in-class and were submitted through the IU online system worth 5% each.
- Two exams at 15% and 20% plus a 5% participation mark were given to assess a student's individual achievements.



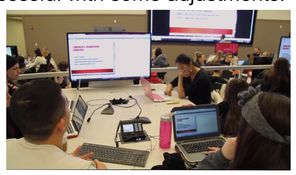

## 5. Online Resource Examples Used




## 6. In-Course Experiences and Adjustments

| Time in Course | Observation | Reasoning | Adjustment |
|---|---|---|---|
| Week 1-3 | Exercises were taking longer than anticipated | PC & software slow to start; individual roles within groups took longer than anticipated | Students asked to login when arriving; group roles took time to develop, Ex. were modified for this |
| Week 2-4 | Exercise questions produced some vague answers | Students found it difficult to balance technical steps (math & mapping) with critical thinking | Ex. modified to apply critical thinking to all elements; gave non-technical Exercises |
| Week 2-6 | Grades were lower than expected for exercises | Assessment was inflexible/formulaic despite above issues | Assessment was modified to include in class question/discussion as well as submissions |
| Week 10-14 | Students not participating as much as others | Group roles became too established | Changed groups with assigned seating |
| Week 14-16 | Students complained about new group roles | Organic group leadership roles were too accepted; new group roles now seem forced | Ex. changed to emphasize individual components in group setting for fairness |
| Week 16 | Exam preparation class poorly attended | Students prefer to study at own schedule? Course content too simple? | Next semester provide online session for Q's based on subset webinar |

## 7. Discussion and Directions



- The application of a Gen Ed freshman environmental science curriculum to a collaborative learning studio has proven to be successful with some adjustments.
- Many online databases and environmental web sites exist that can provide an easy and accessible intro to complex environmental issues.
- Using a text that covers a wide range of subjects with a broad introductory level of depth proved to be essential as very little time was available in class for anything more than an introduction to the exercises.
- When offered again I will also give a series of smaller quizzes to be completed outside of class time in preparation of the course content, minimizing the amount of background lecture before each exercise.
- Campus provided PC units meant no additional software could be loaded; surprisingly mainly (only) federal database sites provided web-based info.
- Course is being offered as a 30 student software version (using tablets) this Fall; some elements will require modification, but similar group dynamics will still exist.

## Acknowledgments & Contact Details

The Center for Innovative Teaching and Learning at IU is acknowledged for providing the support materials to learn how to use the system and advising on the kind of teaching techniques that could prove to be successful. Additional recognition goes to numerous faculty that I had discussions with before and during this course.

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