Linkages Across the Curriculum: A Bilateral Collaborative Learning Project

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Project Overview

• An intervention to bridge the gap between students' knowledge of the economic and environmental impacts of developed-world policies on the developing world.

• A joint curriculum enhancement of four courses emphasized several General Education Goals, especially improving communication and critical thinking.

• Testing a new model for bilateral and collaborative teaching and learning design.

• An experimental teaching intervention in two sets of courses:
  • FREC 100 Issues in Natural Resources and the Environment (Duke)
  • FREC 406 Agricultural and Natural Resource Policy (Awokuse) – *Spring 2005*

  • FREC 450 Topics: Environmental Law (Duke)
  • FREC 410 International Trade (Awokuse) – *Fall 2005*

• Five graded policy "briefs" in each class.

• A semester-long problem: ***Make an argument about how agricultural policy in the developed world impacts the poor in developing countries*** (Spring 2005).

• Opportunities for peer review of writing and revision.

• Colloquium on the semester's problem to enhance oral communication and analytical skills, and for comparison and reflection.

• Preparation of a synthetic brief.

Project Rationale

• Traditional lecture-based instructional format limited in achieving active and collaborative learning.

• Extend collaborative learning to include the synthesis of teaching and learning in two separate, but related, courses.

• Bilateral, group activities between instructors and among students.

• Joint planning and designing of curriculum contents with particular emphasis on subject-matter linkages.

Project Objectives

• Understand how conceptual perspectives and points of view affect the ways we answer policy questions.

• Allow opportunities to practice and improve policy communication in written and oral forms.

• Work in groups to discuss course content issues and solve problems.

• Improve the quality of argumentation and discourse on the issues.

• Develop the ability to make analytic policy arguments in writing.

• Attain effective skills in oral and written communication, quantitative reasoning, and the use of information technology.

Grain shipped to former Soviet Union from Charleston, SC

Loaded ship at dock

Methods

The impact of two sets of pedagogical interventions on student learning was explored. The instructors for both courses collaborated in the planning and development of policy brief issues and the colloquium. Both course syllabi were also revised to reflect and emphasize the collaborative course format.

Instructors' Class Structural Modifications

• Joint design of semester-long problem, rubrics, and intervention on syllabus.

• Two lectures in other's course.

• Frequent meetings on learning progress in courses.
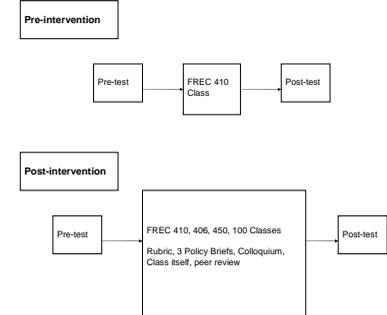
• Joint direction of peer mentor.

Policy Briefs

• Five graded policy "briefs" enhance student competence in applying analytical methods and in written communication.

• The first and fifth brief is the same and the same task is assigned in both classes

• Goals include breaking the overall problem into less intimidating steps. The first brief acts as a pretest of prior knowledge.

• The second, third, and fourth briefs help the students refine their analytical argument through peer review.

• Students present their fifth brief at the colloquium.

• The fifth brief will be a post test, which also asks for a synthetic evaluation based on the results of the colloquium, and will be similar in structure to the pretest.

The Colloquium - Oral Presentations

• Designed and organized a joint half-day student-focused colloquium where students from both courses made oral presentations.

• Colloquium focused on the development of students' oral presentation skills.

• After each presentation, the students and other participants are allowed to ask probing questions, make evaluative statements, or identify logically inconsistent claims in the presented arguments.

• The instructors serve as moderators for the colloquium.

Evaluation of Project Results

• Formal evaluation of student learning, with anticipated dissemination via a published economics journal article.

• Pre- and post-tests evaluated by a panel of outside experts with respect to the rubrics.

• Quantitative measures will be used to evaluate learning outcomes.

• Evaluation approach developed with feedback from Bernhardt, Baer, and Ross.

Pre-intervention

Pre-test → FREC 410 Class → Post-test

Post-intervention

Pre-test → FREC 410, 406, 450, 100 Classes / Rubric, 3 Policy Briefs, Colloquium, Class itself, peer review → Post-test

• Statistical model, estimated as a grouped regression in LIMDEP, allows for interval and hi/low censoring, will be:

$$y_i = a + b_1 I_i + + b_2 F100_i + b_3 F406_i + b_4 F410_i + b_5 F450_i$$

$$+ b_6 C_i + b_7 X_i + e$$

• i indexes students

• Scores, y_i, are the change from the first to fifth policy brief
  • Pre and post scores can be 1, 2, 3, 4, 5
  • Grader provides individual change scores, supported {-4, -3, -2, -1, 0, 1, 2, 3, 4}
  • Average of three graders, supported {-4, -11/3, -10/3, …, 10/3, 11/3, 4}

• I_i = student treated by intervention

• $F100_i$, $F406_i$, $F410_i$, $F450_i$ = class dummy variables

• C_i is the students group colloquium score

• X_i indicates covariates establishing student abilities