Innovative Approach to Active Learning

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“Instruction Matters: Purdue Academic Course Transformation”

Purpose as defined by the Provost

“Partner with faculty and develop a network of individuals committed to the transformation of ten to twenty campus courses per year for three years, integrating a more enhanced student centered approach”.

Specific Goals:

- Faculty will benefit from the best technology, assessment, research and pedagogy support
- Integrate technologies and active learning pedagogies that support the instructional mission of IMPACT
- Develop a project plan that evaluates the process of course transformation and integrates the strategic themes of student success, retention, and completion
IMPACT PROGRAM

- Spring 2011, 3 years
- CIE, ITaP, Discovery Learning Center
- Ten courses: (several examples)
  - AGRY 255 – Soil Science
  - BIOL 131 – Developmental Structure and Function of Organisms
  - CHM 115 – General Chemistry
  - MA 154 – Algebra and Trigonometry II
  - PSY 120 – Elementary Psychology

(Currently we have 49 courses and 61 faculty in the program from 11 colleges.)
University Programs to Familiarize Faculty with Student Based Learning

Workshops: Understanding by Design
Grant Wiggins and Jay McTighe

- Initial Discussion of the Book
- Student Understanding and Essential Questions
- Assessment and Evidence
- Criteria and Validity
- The Learning Plan
Outside Speakers

Robert J. Beichner (SCALE-UP)

- Student Centered Active Learning Environment for Undergraduate Programs

- Place were student teams are given interesting topics to investigate while the instructor facilitates
Student Centered Approach to Instruction

Student-centered Teaching Methods

- Shift the focus of activity from the teacher to the learners.

Active Learning

- Students solve problems, answer questions, formulate questions of their own, discuss, explain, debate or brainstorm during class
Student Centered Learning in the Agronomy Department

Purdue

Introductory Soil Science

Introduction to Environmental Science
Introduction to Environmental Science

**Objective:** Provide students with an understanding of science underlying environmental problems facing the world today.

**Credits:** 3

**Team Taught:** NRES and EAPS

**Activities:** In-class exercises, problem solving, group reports, and case studies.
Introduction to Environmental Science

Hazardous waste disposal, soil erosion, natural hazards, air pollution, population, environmental planning, ecology, water quality and environmental ethics
Introduction to Environmental Science

University Willing to Design and Build New Classrooms
New Classroom Design for Environmental Science

One of Five “SCALE-UP” classrooms

Nine students sit around each table/Three groups per table/Thirty-nine groups

Short lecture/Flip lecture/Guest speakers

Computers

Demonstrations

Problem solving

Case Studies

Discussion
Active Learning

Makes the Learning Environment Exciting

Class Activities
- Promote interest
- Self-confidence

Examples
- In class discussions
- Team work
- Visual instruction
Inquiry Learning
Understanding by Questioning

Encourage Students
- Think critically
- Solve problems
- Case studies
Soil Science Course – already a very interactive format

1. Lecture - Tuesday morning

2. Soils Resource Center – Tuesday to Friday
   (Open 40 hours per week – all faculty are encouraged to critique course material on display and use the Center for materials in their courses)

3. Small Group Discussions - Friday
   groups of 15 students

Meet weekly to review course
Four Benches of Resources Each Week
Numerous displays and experiments
Soils Resource Center

- One topic each week
- Computer Directed
- Three hours per unit
Discussion Sessions on Friday:
A time for reflection and interactive learning

Reflecting on the week

Three tables each with 4-5 students
Three-Phase Discussion Sessions

Reflecting and Writing

Discussing and Sharing

Teaching and Learning
Expanding “SCALE-UP” Active Learning Classrooms

Hicks Library

Discovery Learning Center
Faculty Teaching Introductory Environmental Science and Soil Science at Purdue University

- Each committed to the course
- Encourage collaboration by all soil’s faculty
- Course improvement a priority
- Working for early intervention for students needing assistance
A Focus on Learning: IMPACT

- Designed to encourage explicit discussion of teaching styles, learning styles, and approaches
- Network of faculty committed to course improvement and committed to sharing
- Courses now compete to be part of the IMPACT program
- Strong University support: Provost, Center for Instructional Excellence, IT Learning Resources, Discovery Learning Center