Infusing Technology into Community College Courses

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Project Team
CIESE Background

- Established in 1988
- Pioneer (1993) in Internet in education
- Over $20 million in grants and contracts
- Programs in AZ, OH, FL, NJ, NY & Latin America
- Over 18,000 educators trained
Curriculum Expertise

Inquiry-based
Real-time data
Engaging problems
Telecollaborative
Authentic Learning
The Human Genetics Project

- Curved Thumb
- White Forelock
- Attached Earlobes
- Bent Pinky
The Human Genetics Project

- **free vs. attached earlobes**
- **straight vs. curved thumbs**
- **straight vs. bent pinkies**
- **with vs. without white forelock**
The Human Genetics Project

*In a given population, is the dominant trait the most frequently occurring?*
Was your hypothesis correct?

Will you remember this better as a result?
CIESE Essential Question:

How are educators using the Internet as an educational tool?
Internet-based Applications

- Finding Lesson Plans
- e-Pal Exchanges, Telecollaborative projects
- Simulations
- Publishing Student Lab Reports online
- WebQuests
- Publishing Student Stories to the Web
- Historical Diaries
- Virtual Labs (Interactive Frog Dissection)
- Weather Satellite images
- Using Online Quizzes
- Online Textbook
- Real-time data

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Internet-based Applications

Skill Level

21st Century Workforce Skills

Basic

Advanced

Partially Proficient

Proficient

Advanced Proficient

Online Quizzes

Lesson Plans

Online Textbook

Simulations

Virtual Labs

Web Quests

Historical Diary

Student Web Page

E-Pal / Telecollaborative

Real-time Data

Innovative

Unique and Compelling

Traditional
Internet applications can provide a revolutionary new instructional tool that can create opportunities for students to engage in more authentic learning.

Unique
Cannot be done without Internet technology

Compelling
Provides students with real world learning experiences
Unique & Compelling Applications

Use the Internet as a…

Communication Tool
to connect with experts & other students from around the world:

- Ask-an-Expert
- Telementoring
- Telecollaborative Projects
Unique & Compelling Applications

Use the Internet to…
Access Real Time Data
to problem-solve and think critically:

• Weather Satellite Images
• Remote Sensing Data
• Scientific Databases
Unique & Compelling Applications

Use the Internet to…
Access Primary Source Materials

*Historical documents from the Library of Congress and National Archives*

- Diaries
- Historical Photographs
- Multidisciplinary Lessons
Unique & Compelling Applications

Use the Internet to…
Publish Student Work

Students can engage real audiences about what they are learning and doing.
Savvy Cyber Professor

- Adapts a proven set of K-12 training & curricula materials for use in community colleges
- 26-hour, 8 session hybrid professional development program
- Focus on real-world applications in science, math, educational technology, & language arts
- Library of Real World Learning Objects (RWLOs)
- Instruction for the development and use of RWLOs
Real World Learning Objects (RWLOs)

- Concise core instructional activities focused on discrete topics in higher ed
- Science, math, ed tech and lang. arts
- Incorporate Internet-based “unique & compelling” activities
- Easily used in similar courses at other institutions
A plane is flying due west at 125 km/h. There is a wind blowing from the south at 35 km/h. What is the plane's resultant velocity?

Relative Velocity and Vectors
Learn how to do vector analysis using real time flight and wind data
Graph the function $y=2x^2-3x-2$
What is the domain & range for this function? Find the x and y intercepts and the maximum or minimum point.

Polynomial Functions & Mathematical Modeling
Plot data collected from the Global Sun - Temperature telecollaborative project and determine the mathematical function that best describes the model.
Today’s classroom

Create and submit a poem for instructor to review. Based on feedback and editorial criticism from instructor, revise poem.

Tomorrow’s classroom

Understanding the Writing Process

Review how Walt Whitman revised and refined his ideas and poems by viewing his original notebooks.
Today’s classroom

Use a tutorial to learn the graphing features of Excel. Practice making each of the graphs and charts one by one.

Tomorrow’s classroom

Use Excel to Create a Climatogram

Download and enter real climate data for your city into Excel to create a climatogram. Analyze the chart to determine the "best" and "worst" times of the year to visit your city.
Savvy Cyber Professor Goals

- Learn & incorporate new strategies for teaching
- Use and create RWLOs for use in CC courses
- Ultimately: Model new teaching strategies to pre-service teachers
Session Overview

- **Session 1**: Leveraging the Internet for Learning
- **Session 2**: Introduction to eDesk and Community Tools (online)
- **Session 3**: Using Learning Objects for Meaningful Instruction (online)
- **Session 4**: Course Integration (online)
Session Overview

- **Session 5**: Implementation: Challenges & Solutions (online)
- **Session 6**: Assembling Instructional Content & Creating RWLOs (online)
- **Session 7**: Completion of RWLOs
- **Session 8**: Showcase of RWLOs
How to Get Involved

- Savvy Cyber Professor v 1.0 release - Spring 2005
- 30 CC’s selected by competitive RFP (4 faculty per CC)
- 12 CC – Fall 2005
- 18 CC – Spring 2006
Savvy Cyber Teacher®

- Teacher professional development program
- Enhances science & math education
- Focus on content and implementation of unique & compelling resources
Evaluation Findings

Savvy Cyber Teachers® report:

- Better at teaching problem-solving skills
- Spend less time lecturing
- Teach complex concepts
- Conduct small group learning activities
- Implement cooperative learning
- Manage diverse learning styles

SOURCE: Harcourt Educational Measurement
Evaluation Findings

- Student Impact Study conducted in Spring 2002 in Cleveland, Miami, & Phoenix
- 35 teachers, 4 computer specialists, 1389 students in grades 2-11
- Measured student pre- & post-test scores during implementation of unique & compelling project
- Student Impact Study Results:
  - 86% of students showed noteworthy gains in science and mathematics learning objectives

SOURCE: Harcourt Educational Measurement
“Twelfth-grade students who reported using computers to collect data, download data, or analyze data had higher average scores than students who reported never doing so.”
For More Information

Pathways Project Web Site

http://www.k12science.org/pathways/

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