

Undergraduate Research in an Isolated Community College

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Who is Vincennes University?

- Original Charter 1801.
- Land Grant sold by State.
- Junior College Mission in 1889.
- State funding to VU in the 1970s.
- Comprehensive Community College.
- 60 miles from everywhere.

Approaches Used before CASPiE

- PLTL in developmental course.
- Traditional experiments.
- Six contact hours per week.
 - Laboratory reports for each experiment.
 - Quizzes for each experiment.
- Discovery style experiment for 15 years with good response.

Who does CASPiE Modules?

- General Chemistry II-one of three sections uses a CASPiE module. Students select by their choice or by their schedule demand.
- Second Year Organic Chemistry- both sections do CASPiE. Students have no choice.

Who does CASPiE Modules?

- A second student piloted a new module.
- Four of six faculty members.

Challenges to implementing CASPiE Modules

- Availability of chemical literature.
- Availability of Peer Leaders for second year modules. A valuable experience.
- Availability of equipment and other resources.
- IRB
- Schedule.

Chemical Literature Solutions

- Some articles are reproduced for students to use.
- Some research can be done on internet.
- Field trip to a chemistry library.
- Some national plans for making journal available.

Peer Leader Solutions

- Some skills in place.
- Students in the class assume roles of Leaders.
- Instructor takes leader role.

Equipment/Resource Solutions

- Remote instrument from CASPIE
- Adapting existing equipment.
 - Visible spectrophotometers.
 - Continuous wave IR works fine.
 - Old but OK shaker.
 - Not so good oven.
- Cost of Chemicals.



LUDEN'S

ORIGINAL 1977

lement

WARNING



Strength of Module

Core Concepts

- S_N2 reaction to immobilize phenol.
- Study of strength of nucleophile.
- Back titration to determine chloride loading of resin.
- Use of visible spectrophotometer.
- Solution preparation.
- Titrations.

Strength of Modules Techniques

- Solid phase reactions.
 - Rich history with Merifield resins.
 - Second method for solid phase IR.
 - Use of remote instruments.
 - Application of Raman spectroscopy.
- Antioxidant.
 - Building and using a calibration curve.

Experimental Design

- Solid Phase.
 - Selection of substrate.
 - Selection of reducing agent.
 - Reaction parameter decisions.
- Antioxidant.
 - Selection of product to test.

Flexibility of Schedule

- Malfunctions and backordered chemicals happen.
- We did standard experiments scheduled for later in semester.
- First year module is scheduled with breaks that help keep the CASPiE section coordinated with other sections.

Final Reporting

- First year module prepares posters that are placed in a public area during a convocation hour.
- Second year module students give an oral report.

Benefits

- Generates interest in students not participating.
- Engages students who might be luke warm to a science major.
- Most students enjoy the project and grow because of doing the module.



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