Reaching Their Potential
Through Undergraduate Research

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Undergrad Research at NC State

- Mid 1960’s - early 1990’s
  - Maximum of one or two honors students per year doing independent study/research (mostly independent study)
- 1990’s - present
  - Ten to twelve students per year doing independent study/research (mostly research)
  - Significant participation in REU’s

What Changed?
Attitudes!

• Then:
  – Faculty thought undergrads couldn’t do research
  – Students thought undergrads couldn’t do research and opted for independent study if they did anything

• Now:
  – Faculty see students who are able to do good projects & say “I can mentor kids like this”.
  – Students see other students who are able to do good projects & say “I can do this too!”
Requirements

- **1960’s - early 1990’s**
  - Honors program students encouraged to do independent study/research

- **1990’s - present**
  - Honors program students required to do independent study/research
  - Non-Honors students encouraged to do independent study/research
  - Students encouraged to do REU’s
Need: Projects that Work for Your Student

One size does not fit all. A project should match the student’s

- Interests
- Background
- Ability
- Time constraints

And even then we need to be flexible.
There’s more than one way

- Projects can be supervised in
  - Computer Science
  - Physics
  - Operations Research
  - Economics, etc

- Student is doing a project in 1st major (not math)
  - We ask them to bring in a significant math component and present results to faculty and students
Matching Students with Projects and Faculty

- Web page
  - Lists faculty willing to mentor
  - Projects they’re willing to supervise
  - Pre-requisites needed for project
- List of faculty who have mentored
- Student proposed project
  - Suggest possible mentors
  - Email possible mentors
Encourage Your Students

• “These faculty are willing to work with you!”
  – Web page
  – Math newsletter
  – Student research presentations
• “You can do it too!”
  – Advisors encourage research
  – Student research presentations
  – Student papers
Presentations and Reports

• Oral presentation to math faculty and students
  – Required
  – 15-20 minutes
  – Guidelines provided

• Other presentations recommended
  – NC State Undergrad Research Symposium
  – Regional and national meetings

• Written report
  – Required
  – Guidelines provided
What Else?

• Stronger students are encouraged to do:
  – Tougher projects
  – More than one project
  – REU’s

• Students doing the 5 year BS/MS program can roll over their undergrad project and wind up with a very strong master’s project
The Payoff

Good research makes a big difference:

- Students are more likely to go to grad school
- They go to better grad schools
- They’re more likely to get national fellowships and scholarships
Math REU’s + In-house Research

Math REU's

- Math Ph.D.'s: 14
- Other Ph.D.'s: 2
- 5 yr. BS/MS: 1

Math Ph.D.'s

- Top 10: 5
- 11-25: 6
- Other: 3

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Math Grad Schools

- **1980’s**
  - Berkeley
  - Indiana
  - Rutgers
  - VPI

- **1990’s - present**
  - Princeton
  - Berkeley
  - Stanford
  - NYU
  - UCLA
  - Wisconsin
  - Cornell
  - Maryland
  - Rutgers
  - Urbana-Champaign
  - Penn
  - UT Austin
  - Northwestern
  - Ohio State
  - Duke
  - Penn State
  - UNC
  - NC State
And there’s more!

• 3 DoD Fellowships
• 2 Gates Fellowships
• 1 Fulbright
• 1 Ford Fellowship
• 5 Goldwater Scholarships
What Can You Do?

• Be a research mentor
• Facilitate research
  – Publicize successes
  – Get faculty involved
  – Get students involved
  – Keep records
Bottom Line

Everybody benefits

• Students
• Faculty
• Department
• Institution
• Profession