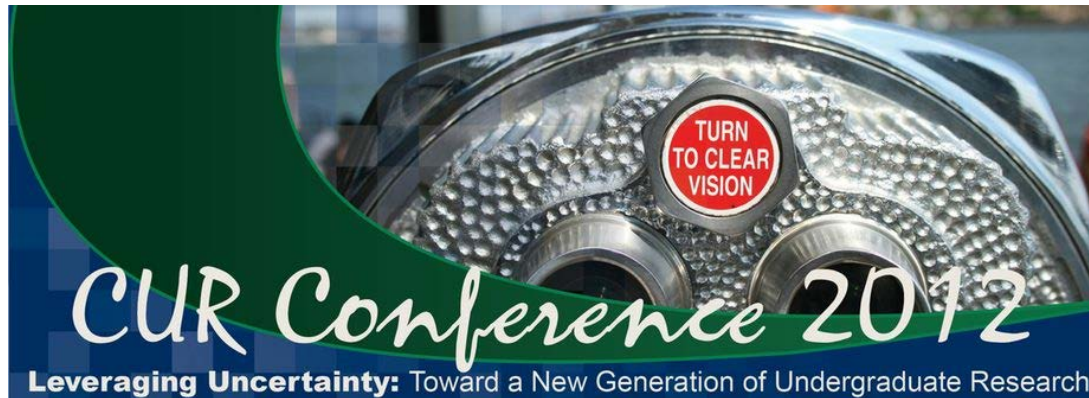


Preparing Women for Success in STEM Graduate Education: CUR Interactive Session

Webster, Lenox, Robertson, Armstead & Kennedy

Westminster College

June 23-26, 2012

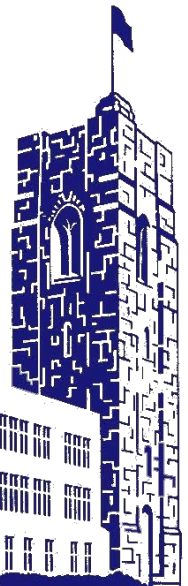


Who's Who?

- Math and Computer Science/Undergraduate Research Directors
 - Terri Lenox
- Biology/ Health Sciences
 - Katherine Robertson
- Physics/ Geosciences
 - Doug Armstead
- Chemistry
 - Sarah Kennedy
- Psychology/Social Sciences
 - Sandra Webster

**WESTMINSTER
COLLEGE**

Founded 1852...New Wilmington, Pa.



Best for Women in STEM

“Westminster College in New Wilmington, Pa., seems like the last place you'd find a great technological discovery.”

Natalie Doss, Forbes Magazine, 12.15.10



The data: Women/Men in STEM = Women/Men in the College

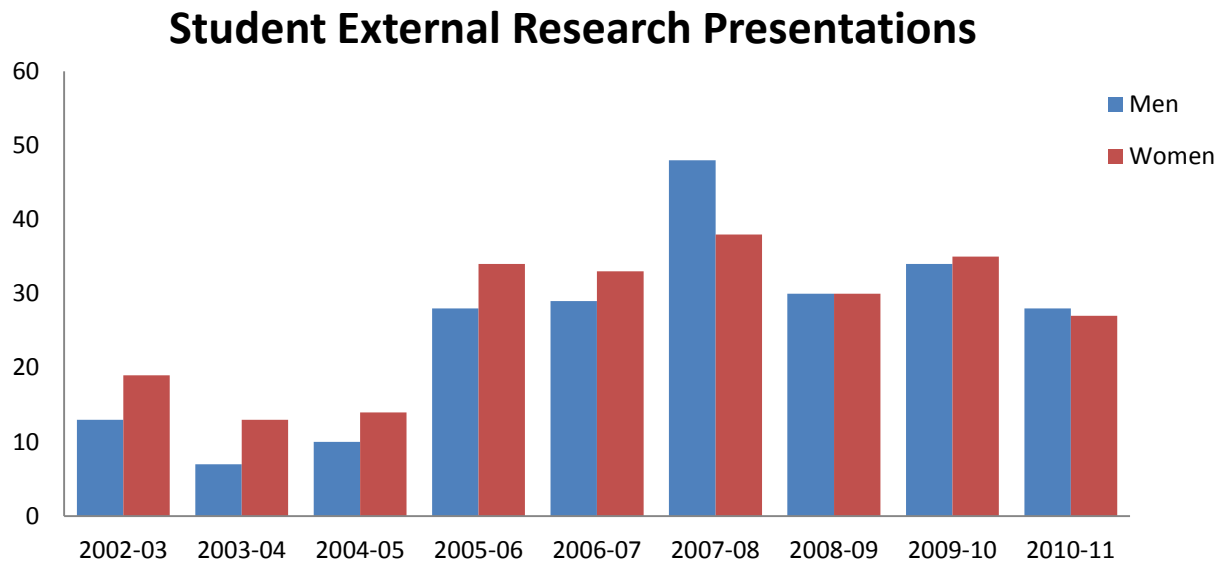
Correlates of Success in Science

- Priming the pump- External science outreach to girls
- Culture of undergraduate research
- Research opportunities for all students to do real science
- Individual mentoring
- Professional school preparation
- Positive role models
- Interdepartmental collaborations
- High faculty expectations
- Disciplinary connections
- Faculty development
- Support constituencies



Culture of Undergraduate Research

- Research defines student.
- URAC – Undergraduate Research & Arts Celebration



Research Opportunities for All Students

- Research opportunities for ALL students regardless of:
 - Career Goals
 - Major
 - Class Rank
- Research required for ALL students.
 - Senior empirical projects required for graduation.



Individual Mentoring



- Students are identified and encouraged to apply research skill early.
- “We push our students rather than drag them along.”
 - Early identification of talented students
 - Early encouragement to research activities
 - Professor often initiates the research activities with invitation to join research team

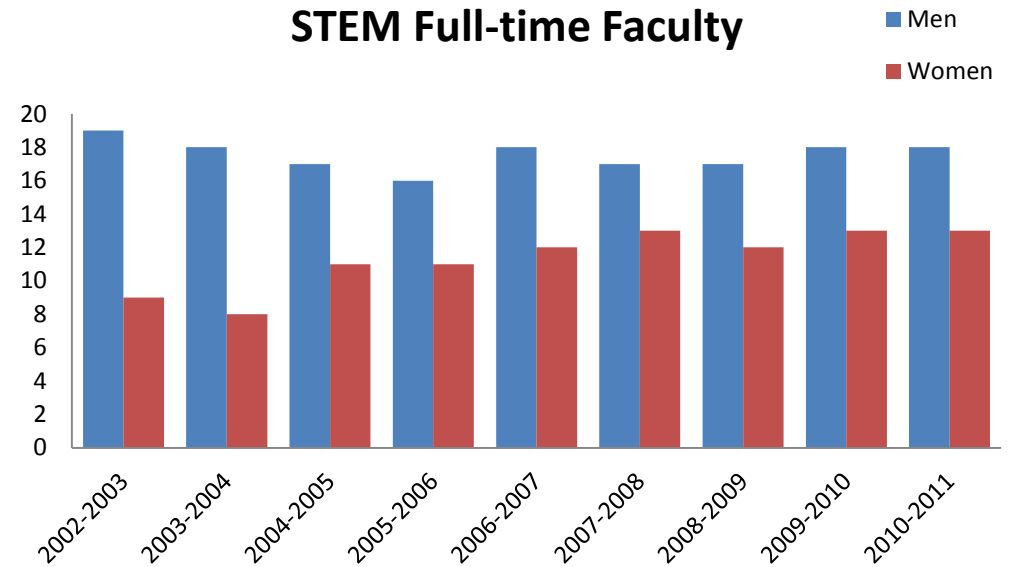
Professional School Preparation

- Current content
- Rigor
- Sequencing
- Integrated hands on research in lab courses
- Experiential Learning



➔ Better education for all students.

Positive Role Models



- Women faculty members doing research with students.
- Women faculty members have lives, families, other interests → bust stereotypes.
- Women students (sophomores, juniors and seniors) engaged in research.

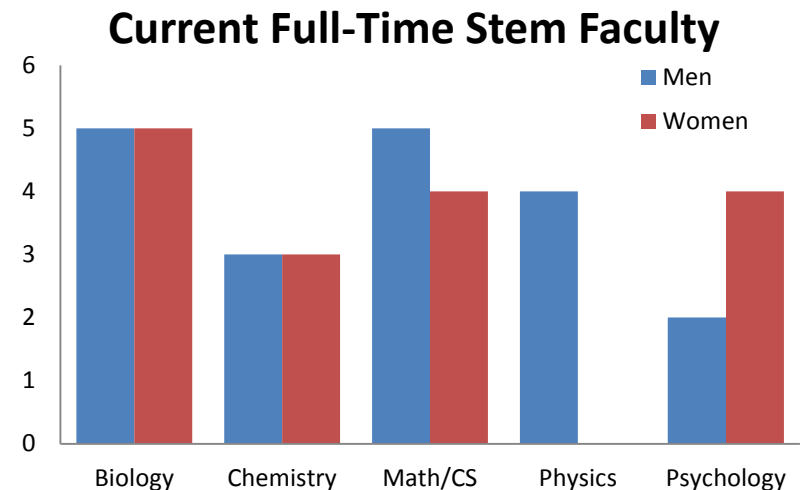
High Faculty Expectations

- Students expected to succeed without gender qualifications.
- Faculty are more interested in student success than in their own recognition.
- Some faculty members let student questions guide their research.



Interdepartmental Collaborations

- Hoyt Science Center- Central housing facilitates cross-discipline interaction.
- Curriculum requires cross-discipline courses.
- Math requirements with strong women faculty models teaching many of the courses.
- Student collaborations
 - Geek Week
 - Cluster courses
 - Research collaborations



Connected to Disciplines

- Faculty members have active research agendas
 - Students collaborate on real research
- Student participation in meetings and publications.
 - See Women Scientists
 - Become aware of the discipline as researchers, not as students only.



Faculty Development

- Faculty/student collaboration valued
 - Counts for tenure and promotion
 - Travel funded for faculty and students
- Workshops and training on supervising undergraduate research.
- FDO + FDC + FFF
- URAC + DCETL + DUR
- Department chairs, budget, schedule and support undergraduate research.



Constituencies

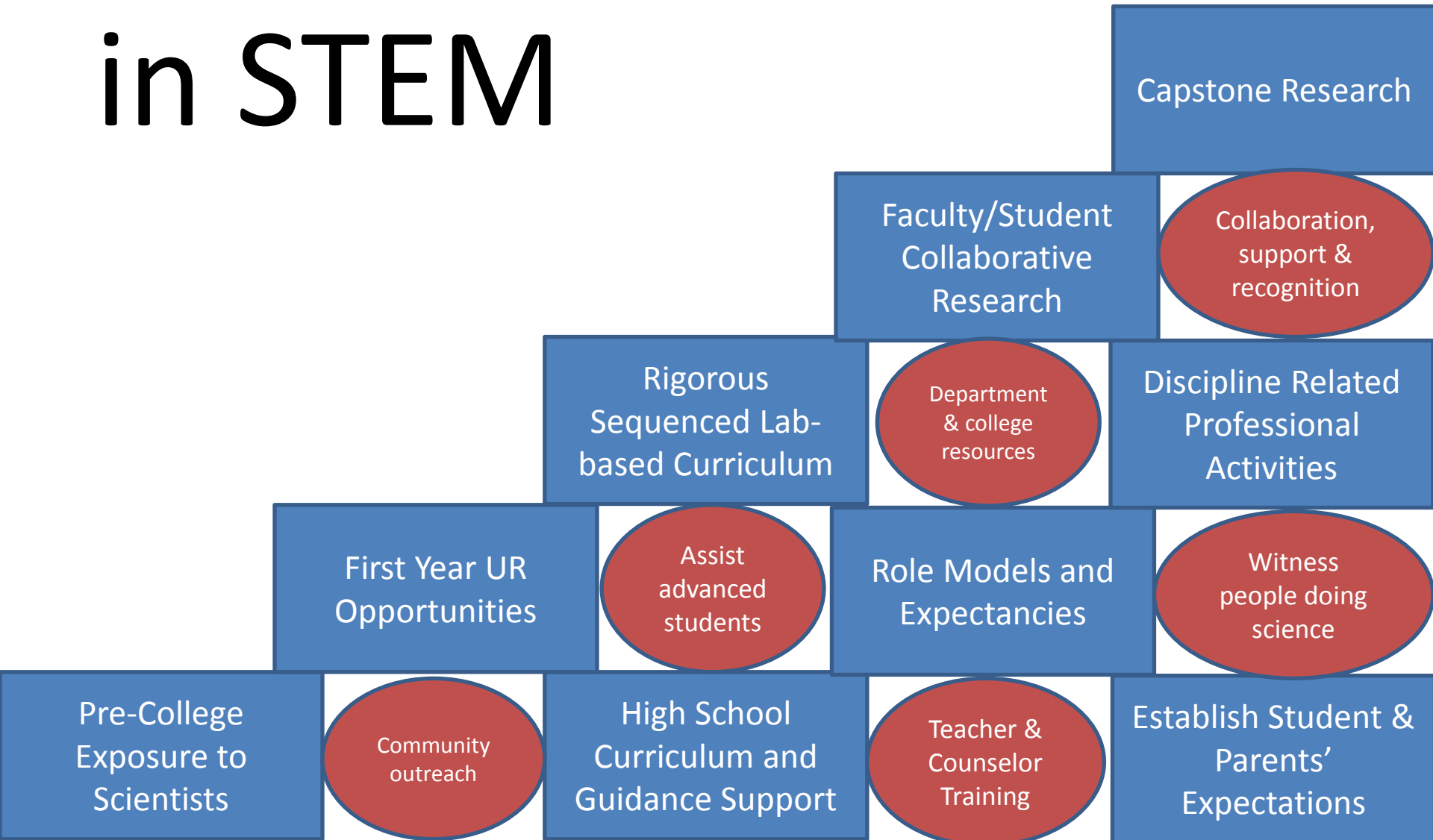
- SGA – Student Government strong support for URAC (including NCUR)
 - Student Science Clubs
 - Geek Week
- Women’s Support Groups
 - Women’s symposium
 - Women of Hoyt
 - Women in Professional Associations



Small Group Discussions

- What are the current challenges for student success (including women) in STEM careers?
- Should there be different expectations, resources or opportunities for women students in STEM majors?
- How should we prepare our students for the reality of stereotypes and sexism after graduation?
- What are motivators for women students? Do the same motivators have different efficacy?

STEPS to SUCCESS in STEM



Environment to Promote Success

Student	Faculty	Department	Institution	Discipline	Society
Talent	Talent	Curriculum	Culture	Content	Acceptance
Interest	Knowledge	Recognition	Resources	Role Models	Value
Effort	Skills	Program	Respect		Jobs
	Time	Supplies	Recognition		
	Expectation	Time & Space	Cross-discipline synergy		

Thanks

- For more information contact Sandra K. Webster at websters@westminster.edu