Community Building: Bridging Boundaries & Forming Connections

Jan M. Yarrison-Rice
Physics Department
Miami University
Oxford, OH
yarrisjm@muohio.edu
Special Thanks to:

• Colleagues in Physics Department

• Residence Life Staff
  Nicole Raney, Head Resident, WIMSE
  Chuck Leonard, Theme Learning Facilitator
A Question:

Are there significant boundaries for women undergraduates?
• Women have been actively recruited by the sciences for the past 20 years

• Women are still underrepresented at all levels

• Conditions for women, in large part, have only changed incrementally

• Recruitment of women in the absence of retention is insufficient
• Greatest loss of women in SME occur in the First and Second years

• Barriers to retention include:
  – Lack of self-confidence in scientific ability
  – Not being accepted into department
  – Feeling intimidated
  – Isolation
Boundaries…

• Clearly significant boundaries to women’s success --

• Can these be bridged?

• Will forming connections help create a foundation to build on?
Really, a simple question…

Can women and minority students find community?
Bridging boundaries & forming connections

• Community building in the physics department
  – Forming connections on all levels within the department

• Community building beyond physics
  – Bridging disciplinary lines to form connections
Community building within Physics Departments

• One-on-One
  – Mentors
  – Friends
  – Teachers

• Groups
  – Class cohorts
  – Study groups
  – Research groups
  – SPS
Miami University’s Physics Department – a few highlights
Some enrollments …

<table>
<thead>
<tr>
<th>Year</th>
<th>BS Physics</th>
<th>BS Eng Physics</th>
<th>BA Physics</th>
<th>Men</th>
<th>Women</th>
<th>Dept. TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994-95</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>13</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>1995-96</td>
<td>9</td>
<td>7</td>
<td>1</td>
<td>12</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>1996-97</td>
<td>4</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>1997-98</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td>12</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>1998-99</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>10</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>1999-2000</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
</tbody>
</table>
Physics Faculty & Graduate Students

- **Faculty - 15 full time, 2 visiting**
  - Women - 2 full time, 1 visiting
  - Persons of Color - 1 full time

- **Masters Students - 15 full time TAs**
  - Women - 3
  - Persons of Color - 3
Strong Commitment to Teaching

Excerpts from the “Statement of Effective Teaching”

• Student learning is the most important responsibility
• The goals of physics teaching are to guide and facilitate student understanding …
• To ensure equity …
• Treat one another and their students with the respect due colleagues in the academic enterprise
Small Classes

• First Year Classes - 20 per section & taught by full time faculty

• First Year Labs taught by TAs and UAs

• Second Year Onward taught by full time faculty - even labs
Open Door Policy

• Faculty are readily available even outside of scheduled office hours(!)
Group Work is Encouraged

- Homework groups
- In-class small group work
  - Mini-experiments
  - Tutorials
  - Discussions
- Projects
- Presentations
Research

• Undergraduate research is encouraged and supported by all faculty

• Students join a lab as early as their first year

• Often students are supported financially during summers

• Small communities are formed between undergraduates, graduate students, & faculty
Samir Bali’s Lab

- Quantum Optics
  - Atoms trapped in MOTs and Lattices
- Studies quantum properties of emitted light
- 2 undergrads, 1 grad
Jan Yarrison-Rice’s Lab

- Near Field Scanning Optical Microscopy
  - Study photonic band gap structures
- Obtain spatial light distribution on nanometer scale
- 2 Second Year students & 1 Senior
Gatherings

- UG and Gs congregate in *common spaces*
- UAs and TAs form mentoring relations
- Research groups go to lunch together on regular basis (both students and faculty)
- Annual Student/ Faculty Retreat -- student input on agenda
Gatherings (cont.)

• Semi-annual Picnics for full department & families

• Annual Dinners with the Chair for each class

• UG and G representative at weekly faculty meetings

• End of semester celebrations
Outreach to Alumni

• Yearly Newsletter

• Periodic Survey of Alumni

• Highlighting Alumni Successes on Departmental Website

• Invitations sent to alumni for all special speakers
Alumni Respond

- Bring Alumni back to give seminars (2-4 per year)
- High percentage of survey returns and visits by alumni
A strong department will

- Foster an excitement for physics
- Create a supporting & sharing atmosphere
- Celebrate the strengths of each individual
- Facilitate bridges and connections
Community Building *beyond* Physics

- *Bridge* traditional discipline boundaries

&

- *Form connections* with other women in related fields
Miami’s Women in Mathematics, Science, & Engineering -- *WIMSE* Program

- Founded 1991, with small monthly meetings
- Now a theme learning community, part of the residence hall programming
Goals of **WIMSE**

- A living learning community

- Women live together, learn together, & explore their futures together

- Women also socialize with each other, support each other, & study together
Connections and Bridges

• Reaching across fields
  – Other UG women in MSE majors

• Looking forward
  – Grads & Faculty on campus
  – Other professional women

• Giving back
  – Sponsoring events for K-12 women
Advisory Structure of WIMSE

• Faculty Advisor
  – Jan Yarrison-Rice

• Advisory Committee
  – Women faculty

• Residence Life Staff
  – Head Resident
  – Facilitator
  – RAs

• Residents
  – 1st Years & Upper Level
### Women in residence

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>First Year Women</th>
<th>Upper Level Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>98/99</td>
<td>28</td>
<td>NA</td>
</tr>
<tr>
<td>99/00</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>00/01</td>
<td>45</td>
<td>26</td>
</tr>
<tr>
<td>01/02</td>
<td>38</td>
<td>23</td>
</tr>
<tr>
<td>02/03</td>
<td>34</td>
<td>15</td>
</tr>
</tbody>
</table>
• Academic

• Careers

• Social

Programming
Academics

• **First Year Seminar each Fall**
  – Ethics & Science
  – Based on Scientific Integrity by Francis Macrina, ASM Press, 2000

• **Weekly Study Sessions**
  – Calculus, Chemistry, & BMZ

• **Mentoring**
  – Informal and Formal
  – Senior students to juniors & Faculty to students
Social Events

• Faculty Dinners
• Group Dinners
• Receptions
• Lunch with Grad Students
• Clogging
Career Advice

• Programs with Grad Students -- selection of schools, advisors, and research topics.

• Programs with faculty describing their career paths

• Partnership with Proctor & Gamble’s Women in Science Group
WIMSE

Advantages

• “Not the only one”
• Ability to find a support person

Downside

• Are we weak?
• Is this an unfair advantage?
Additional *WIMSE* Programs

- Reading & writing scientific articles
- Being a pre-med
- Balancing careers & personal lives
- Interviewing skills
- Research at Miami
- Summer internships
Communities outside the department...

• Research (both academic and industrial) is increasingly multi-disciplinary

• A model for support in your profession must bridge the disciplines

• Interdisciplinary research teams allow women to look outside their specialty for a cohort to support their advancement
Summary

• Changes are incremental rather than transformational.

• **Women find support from -- peers, instructors, mentors, and upper level students.**

• **These communities bring a richness to the physics learning environment and an increasingly supportive environment for women.**
Programs which bridge boundaries and support multiple connections will form:

a Dynamic, Engaging, and Supportive Community!
Bibliography


