Use of Cross Disciplinary Groups to Improve PSM Student Peer Education

66th Annual Meeting of the Midwestern Association of Graduate Schools
Cincinnati, OH
April 22nd, 2010
Grand Valley Overview…

- Established in 1960, 50th-yr celebration in 2010-11
  - History as an undergraduate institution serving west Michigan
- Current total enrollment is 24,408; ~15% graduate
- 123 doctoral and 3,435 masters students for 2009-10
- ~25% of degrees awarded annually are graduate degrees
- 28 graduate degree programs
  - Clinical doctorates
    - DPT in Physical Therapy
    - DNP in Nursing
  - EdS program in Educational Leadership
  - 25 Master’s degree programs; 46 degree options
PSM Program History at GVSU

- Sloan Foundation Grant – 2003
- First students matriculated in F’04
  - ~ 10 each in Biotechnology, Bioinformatics, and Biostatistics
- Today…
  - 85 active students across programs (28, 25, and 31, respectively)
    - 38% are international students
    - 45% are female
    - 18% are part-time
  - 45 graduates (18 in Biotech; 15 in Biostats; 12 in Bioinformatics)
  - Lost 12 Biotech students over time to MS in CMB
- Fall 2011 enrollment goal
  - 100 FTE students
Our current PSM programs:

- **M.S. in Cell & Molecular Biotechnology**: The application of cell and molecular biology for medical, agricultural and industrial purposes.

- **Leadership, Communication, Teamwork, Ethics**

- **M.S. in Biostatistics**: The application and development of statistical techniques for the biological and health sciences.

- **M.S. in Medical and Bioinformatics**: The use of computer technology to manage and analyze information in the life and health sciences.
Medical & Bioinformatics, M.S. Medical and Bioinformatics utilizes computer technology to manage and analyze information in the life and health sciences. This degree is granted by the School of Computing and Information Systems within the Padnos College of Engineering and Computing.

Cell & Molecular Biology, M.S. (Biotechnology Emphasis) Biotechnology involves the industrial use of living organisms to produce food, drugs, and other products. This degree is granted by the Cell and Molecular Biology Program within the College of Liberal Arts & Sciences.

Biostatistics, M.S. Biostatistics involves the application of statistical techniques to scientific research in the life and health sciences. This degree is granted by the Statistics Department within the College of Liberal Arts & Sciences.
<table>
<thead>
<tr>
<th>Internship Sites</th>
<th>Num Interns</th>
<th>Num BINF</th>
<th>Num BSTA</th>
<th>Num CMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Internship Sites Thru W09</td>
<td>17</td>
<td>5</td>
<td>8</td>
<td>10</td>
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<tr>
<td>Van Andel Research Institute</td>
<td>11</td>
<td>2</td>
<td>3</td>
<td>6</td>
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<tr>
<td>Arivium</td>
<td>5</td>
<td>4</td>
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<td>1</td>
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<tr>
<td>Mich Blueberry Growers</td>
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<td>MPI Research</td>
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<td>Next Generation Therapeutics</td>
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<td>Spectrum Health</td>
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<td>Annis Water Resources Institute</td>
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<td>Kent County Health Department</td>
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<td>St Marys Healthcare</td>
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<tr>
<td>Center for Molecular Medicine</td>
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<td>GVSU- CMB</td>
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<td>Mich High Throughput Screening Center</td>
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<td>Michigan State University</td>
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<td>Internship Totals Thru W09</td>
<td>43</td>
<td>11</td>
<td>13</td>
<td>19</td>
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</tbody>
</table>
GVSU 2008 PSM Biostatistics Grads Stay in Michigan

From left: Craig Johnson, Heather Houseman, Becky Twing, Justin Sjogren and Tom Holmes
From Left: Greg Cavey, P.I., Caryn Lehner, GVSU PSM Cell & Molecular Biotechnology M.S. 2007, Paula Davidson
Patrick Richardson 📊

Biostatistician at the Van Andel Research Institute
Greater Grand Rapids, Michigan Area | Biotechnology

Patrick Richardson is working on SAS Certification. 24 days ago

Current
• Biostatistician at The Van Andel Institute
• Principal at Richardson Consulting Services, L.L.C.

Past
• Finance Manager at Rapid Air
• Commercial Pilot / Flight Instructor at Rapid Air

Education
• Grand Valley State University
• Davenport University
• Aquinas College

Recommendations
3 people have recommended Patrick

Connections
32 connections

Websites
• Van Andel Research Institute
• Prgm of Translational Medicine
• Коммерсант

Public Profile
http://www.linkedin.com/in/patrickjrichardson

PSM Biostatistics M.S., 2008
GVSU PSM Medical & Bioinformatics Grad

<table>
<thead>
<tr>
<th>Susan Conarroe</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Biomedical Informatics Professional</td>
<td></td>
</tr>
<tr>
<td>Greater Seattle Area</td>
<td>Information Technology and Services</td>
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</tbody>
</table>

### Current
- Informatics Supervisor, UW Autism Center at University of Washington

### Past
- Clinical Research Technician at Spectrum Health
- Visiting Researcher at Van Andel Institute
- Senior Developer at Case's Ladder

### Education
- Grand Valley State University
- Centre College

PSM Medical & Bioinformatics M.S. 2007
**Bertrand Eban**

*Associate Scientist at Emergent BioSolutions*

Greater Grand Rapids, Michigan Area | Biotechnology

<table>
<thead>
<tr>
<th>Current</th>
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</thead>
<tbody>
<tr>
<td>• <em>Associate Scientist at Emergent BioSolutions</em></td>
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</table>

<table>
<thead>
<tr>
<th>Past</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Research Assistant (Intern) at Michigan high throughput screening center</td>
</tr>
<tr>
<td>• Laboratory Technician at South Texas Nuclear pharmacy</td>
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</table>

<table>
<thead>
<tr>
<th>Education</th>
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<tbody>
<tr>
<td>• Grand Valley State University</td>
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<td>• Texas Southern University</td>
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</tbody>
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PSM Cell & Molecular Biotechnology M.S., 2008
Blueberry breeder felt need to go back to school

By ROEL GARCIA
The Holland Sentinel
Posted Apr 26, 2008 @ 06:00 AM

Laketown Township, MI — Ed Wheeler balanced many aspects of his life for three years: family, work and graduate school.

Today, April 26, Wheeler graduates from Grand Valley State University with a master’s degree in cell molecular biology.

The Laketown Township resident is 53, been married to wife JayLynn for eight years and has two grown children and works full-time as a blueberry breeder for Michigan Blueberry Growers Association in Grand Junction. He finished his undergraduate degree from Western Michigan University in 1977.

At age 53 Ed wheeler will graduate from Grand Valley State University with his masters in Science on Saturday. Wheeler is not a typical student.

Wheeler felt he needed to go back to school based on his work with developing varieties of blueberries.
In addition to technical skills, ethics and critical thinking, PSM degrees emphasize “soft skills” including:

- Interpersonal skills
- Leadership skills
- Communication skills
- Problem solving skills
- Teamwork
PSM Interdisciplinary Survey Items

- Did you find/feel working in an interdisciplinary group…
  - Made the task easier or more difficult?
  - Allowed your group to be more successful working on the project?
  - Helped you learn more about the subject?
  - Promoted “peer teaching?”

- Do you think that jobs in industry require work in interdisciplinary groups?

- Do you feel that it would be beneficial to your education to work in interdisciplinary groups?

- Please write any comments you have about working in interdisciplinary groups
Made the task easier or more difficult?

**All PSM Students**

- Definitely easier
- Somewhat easier
- Neither easier nor more difficult
- Somewhat more difficult
- Definitely more difficult
Made the task easier or more difficult?

**Biotech**

- **Definitely easier**: 50
- **Somewhat easier**: 60
- **Neither easier nor more difficult**: 20
- **Somewhat more difficult**: 0
- **Definitely more difficult**: 0
Made the task easier or more difficult?

**Medical and Bioinformatics**

- Definitely easier: 0
- Somewhat easier: 10
- Neither easier nor more difficult: 50
- Somewhat more difficult: 40
- Definitely more difficult: 40

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[Diagram showing distribution of responses]
Made the task easier or more difficult?

![Bar chart showing responses to the question: Made the task easier or more difficult?](chart)

**Biostats**

- Definitely easier: 20
- Somewhat easier: 15
- Neither easier nor more difficult: 45
- Somewhat more difficult: 10
- Definitely more difficult: 20
Made the task easier or more difficult?

2nd year PSM

<table>
<thead>
<tr>
<th>Perception</th>
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<tbody>
<tr>
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<tr>
<td>Somewhat easier</td>
<td>55</td>
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<td>Neither easier nor more difficult</td>
<td>15</td>
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<tr>
<td>Somewhat more difficult</td>
<td>5</td>
</tr>
<tr>
<td>Definitely more difficult</td>
<td>0</td>
</tr>
</tbody>
</table>
Allowed your group to be more successful?

All PSM Students

- Definitely yes
- Yes
- Neither yes nor no
- No
- Definitely no
Allowed your group to be more successful?

![Bar chart showing responses to the question: Definitely yes, Yes, Neither yes nor no, No, Definitely no.

- Definitely yes: 30
- Yes: 40
- Neither yes nor no: 20
- No: 10
- Definitely no: 0]
Allowed your group to be more successful?

![Bar chart showing responses to the question:]

**Medical and Bioinformatics**

- **Definitely yes**: 35
- **Yes**: 30
- **Neither yes nor no**: 30
- **No**: 30
- **Definitely no**: 0
Allowed your group to be more successful?

Biostats

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Definitely yes</td>
<td>10</td>
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<tr>
<td>Yes</td>
<td>35</td>
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<tr>
<td>Neither yes nor no</td>
<td>30</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
</tr>
<tr>
<td>Definitely no</td>
<td>15</td>
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</table>
Allowed your group to be more successful?

2nd year PSM

- Definitely yes: 30
- Yes: 45
- Neither yes nor no: 20
- No: 5
- Definitely no: 0
Helped you learn more about the subject?

All PSM Students

- Definitely yes: 20
- Yes: 50
- Neither yes nor no: 10
- No: 10
- Definitely no: 0
Helped you learn more about the subject?

![Bar chart showing responses to the question about learning about Biotech.]

- Definitely yes: 30
- Yes: 40
- Neither yes nor no: 20
- No: 10
- Definitely no: 0
Helped you learn more about the subject?

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**Medical and Bioinformatics**

- Definitely yes: 10
- Yes: 70
- Neither yes nor no: 20
- No: 10
- Definitely no: 0

---
Helped you learn more about the subject?

- Definitely yes
- Yes
- Neither yes nor no
- No
- Definitely no

Biostats
Helped you learn more about the subject?

2nd year PSM

- Definitely yes: 40
- Yes: 60
- Neither yes nor no: 20
- No: 10
- Definitely no: 0
Promoted “peer teaching?”

All PSM Students

- Definitely yes: 10
- Yes: 50
- Neither yes nor no: 20
- No: 5
- Definitely no: 0
Promoted “peer teaching?”

- Definitely yes
- Yes
- Neither yes nor no
- No
- Definitely no

Biotech
Promoted “peer teaching?”

Medical and Bioinformatics
Promoted “peer teaching?”

Biostats

- Definitely yes: 20
- Yes: 35
- Neither yes nor no: 10
- No: 30
- Definitely no: 35
Promoted “peer teaching?”

2nd year PSM

- Definitely yes: 20
- Yes: 60
- Neither yes nor no: 20
- No: 0
- Definitely no: 0
Do you think that jobs in industry require work in interdisciplinary groups?

**All PSM Students**

- Definitely yes: 50
- Yes: 50
- Neither yes nor no: 0
- No: 0
- Definitely no: 0
Do you think that jobs in industry require work in interdisciplinary groups?

**Biotech**

<table>
<thead>
<tr>
<th>Option</th>
<th>Count</th>
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<tbody>
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<td>Definitely yes</td>
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<tr>
<td>Yes</td>
<td>40</td>
</tr>
<tr>
<td>Neither yes nor no</td>
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</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Definitely no</td>
<td>0</td>
</tr>
</tbody>
</table>
Do you think that jobs in industry require work in interdisciplinary groups?

**Medical and Bioinformatics**

- **Definitely yes**: 60
- **Yes**: 40
- **Neither yes nor no**: 10
- **No**: 0
- **Definitely no**: 0
Do you think that jobs in industry require work in interdisciplinary groups?

**Graph:**

- **Biostats**

- ** Definitely yes:** 40
- ** Yes:** 50
- ** Neither yes nor no:** 0
- ** No:** 0
- ** Definitely no:** 0

**Question:** Do you think that jobs in industry require work in interdisciplinary groups?
Do you think that jobs in industry require work in interdisciplinary groups?

2nd year PSM

- Definitely yes: 50
- Yes: 40
- Neither yes nor no: 0
- No: 0
- Definitely no: 0
Will it be beneficial to your education to work in interdisciplinary groups?

Al PSM Students

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Count</th>
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<tbody>
<tr>
<td>Definitely yes</td>
<td>40</td>
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<tr>
<td>Yes</td>
<td>35</td>
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<tr>
<td>Definitely no</td>
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</table>
Will it be beneficial to your education to work in interdisciplinary groups?

**Biotech**

- Definitely yes: 55
- Yes: 40
- Neither yes nor no: 10
- No: 0
- Definitely no: 0
Will it be beneficial to your education to work in interdisciplinary groups?

Medical and Bioinformatics

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Count</th>
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<tbody>
<tr>
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<td>Yes</td>
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<tr>
<td>Neither yes nor no</td>
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<td>No</td>
<td>2</td>
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<tr>
<td>Definitely no</td>
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</table>
Will it be beneficial to your education to work in interdisciplinary groups?
Will it be beneficial to your education to work in interdisciplinary groups?

2nd year PSM

- Definitely yes: Bar
- Yes: Tall bar
- Neither yes nor no: Small bar
- No: No bar
- Definitely no: No bar
So, what’s up with the biostatistics students?

- Many are employed full-time – it is hard to find time to get together with students to work on projects.
- They do not come from a culture of group projects.
- Most are local students....
Some thoughts:

- Interdisciplinary groups work well
  - If the task can benefit from a combination of areas of expertise
- Successful groups will need to take into account extracurricular obligations of the students (work, family, etc.)
- Completing internships earlier may be useful, but there is always a tension between getting to the internship quickly and having acquired the skills to complete a successful internship
Questions or Comments?