Data Buddies: Partnering for Comparison Data

*a CRA-W/CDC Project*

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*Presented at the Council of Graduate Schools 6/20/12*
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BPC Alliance: Widening the Research Pipeline
Alliance Activities

Tapia Celebration
Sending Students/Mentors to Conferences

Collaborative REU
(CREU)

Distributed REU
(DREU)

Grad Cohort

Career Mentoring Workshop
Academic Workshop

CAPP

Undergraduates
Graduate Students

Academic careers
Industry/government labs

Alliance
CDC
CRA-W

Distinguished Lecture Series
Discipline-Specific Mentoring Workshops
Data Buddies/Evaluation

Addressing the Shrinking Pipeline
IEEE-CS Distinguished Visitors Program
CREU Numbers

542 undergraduate URM+Ws across the USA have participated in CREU!

223 CREU projects have been funded!
DREU Numbers

643 undergraduate URM+Ws across the USA have participated in DMP/DREU!

96 research universities have hosted DMP/DREU students from 282 institutions!
What did we learn?

Learned that ~30-40% of CREU/DREU participants enrolled in graduate school (mainly Ph.D. programs)
Experience feeling like a member of a research community

Knowledge about criteria for admission to graduate programs

Knowledge about what it is like to do computing research

BPC CREU/DREU Evaluation (in program)
Are we spending our money wisely?
Data Buddies: A Better Measure of Evaluation
Why Data Buddies?

• Our participants are nationwide

• Participants from many institutions come to us as individuals

• In theory, our comparison group is “all computing undergraduates in the US”
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Sampling by Department

- Don’t sample individuals, sample departments
- Then survey all students
- Starting point: departments from which participants came in 2008-2010
- Categorize by program type
  - Top-ranked PhD
  - Other PhD
  - Masters-only
  - Bachelors-only
- Then invite randomly
Recruiting Departments

- **Reasons for them to participate**
  - Department report on responses of their students compared to programs of the same type
  - Department stipend

- **How they participate**
  - Contact person facilitates our surveys of students and faculty
  - Encourage individual participation
Randomly Selected Departments: Spring 2011

- PhD Programs ranked 1-36 (8):
  Georgia Tech, Northwestern, Penn State, Stanford, UCLA, U Mass Amherst, UNC, Yale

- Other PhD Programs (13):
  Dartmouth, New Mexico State, Old Dominion, Syracuse, U of Kansas, Missouri-Columbia, Nevada-Reno, New Mexico, South FL, Texas at Dallas, Utah, Wash at St. Louis, Worcester Polytech

- Master’s (8):
  CUNY Queens, Miami U-Oxford, St Joseph’s, Texas Southern, U of Akron, Illinois-Springfield, Michigan-Flint, and Western Oregon

- 4-year (17):
  Albany State, Cal State-Stanislaus, CUNY Hunter, Harvey Mudd, Kean, Millersville of PA, Radford, Sonoma State, SUNY Plattsburg and Potsdam, U Hartford, Hawaii-Hilo, Houston-Downtown, Minnesota-Morris, Nebraska-Kearney, Puget Sound, and Wellesley
We have the departments and two years worth of valuable data... Now what?
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Survey Content

• Student experience in their department, with mentoring, with research, with professional networks
• Interest and confidence in continuing on a research track
• Highest intended degree
• For completing students, plans for the following fall
## Survey Responses

<table>
<thead>
<tr>
<th>Group</th>
<th>Spring 2011 (graduating)</th>
<th>Fall 2011 (continuing)</th>
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</thead>
<tbody>
<tr>
<td>Departments</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>Undergraduate Students</td>
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<td>2329</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>555</td>
<td>1260</td>
</tr>
</tbody>
</table>
Spring 2011: **Graduating Students**

- **Participants**
  - Collaborative Research Experience for Undergraduates (CREU)
  - Distributed Research Experience for Undergraduates (DREU)
  - Grad Cohort
  - Career Mentoring Workshops

- **Non-Participants**
  - Recruited through Data Buddy Departments
Spring 2011: Graduating Students

- **Undergrad** participants more likely than non-participants to
  - Have applied to grad school in computing (51% vs. 23%);
  - Be attending grad school in computing in fall 2011 (39% vs. 19%);
  - Be enrolled in a PhD program if attending grad school (81% vs. 18%).
Spring 2011: Graduating Students

- **Undergrad** participants also more likely than non-participants to report

  - Having a research advisor as a mentor (41% vs. 24%);
  - Their mentor discussed grad school options with them (80% vs. 70%).
Spring 2011: Graduating Students

Research Path Comparisons for CRA-W/CDC Program Participants and Nonparticipants

- Highest degree intended is a PhD:
  - Participants: 39%
  - Nonparticipants: 27%
  - All Nonparticipants: 17%

- Research experience encouraged grad school immediately:
  - Participants: 73%
  - Nonparticipants with research experience: 55%
  - All Nonparticipants: 30%

- Enrolled in graduate school in computing in Fall 2011:
  - Participants: 39%
  - Nonparticipants with research experience: 22%
  - All Nonparticipants: 19%

- Enrolled in a PhD program:
  - Participants: 81%
  - Nonparticipants with research experience: 41%
  - All Nonparticipants: 18%
Graduate (PhD) participants appear to have stronger professional networks than non-participants.

- 87% report having *some* or *quite a bit* of knowledge about developing their professional networks.
- 71% served on departmental, conference or professional society committees during graduate career.
Data Potential

- Data collection efforts would yield results other than those arising from participant vs. non-participant comparisons.
Why Students **don’t** do Research

- **Graduating** students did *not* participate in undergrad research for the following reasons

  - **All**: *no time*
  - **Women**: *not interested*
  - **URM**: *applied, but turned down*
  - **Non-URM**: *didn’t pay well enough*
Fall 2011: Continuing Students

- **Undergrad** participants (compared to non-participants with research experience) more likely to attend or have attended national, regional and diversity conferences

  - **URMs** at Bachelor’s degree granting institutions are less likely to participate in diversity conferences because they are unaware of their existence.
Fall 2011: Continuing Students

- **Undergrad** participants (compared to non-participants with research experience) have more contact with computing professionals outside their home institution

  - National computing conferences
  - Diversity conferences
  - Networking/Mentoring workshops
  - Research Experiences for Undergraduates
Fall 2011: Continuing Students

- **Graduate** participants served on more departmental, conference or professional society committees

  - 45% of **PhD** participants (vs. 28% of non-participants) served on at least one committee;
  
  - 43% of **Master’s** participants (vs. 9% of non-participants) served on at least one committee.
Fall 2011: Continuing Students

• **Graduate** participants attended more conferences than non-participants

  – Relative to other students within their grad program and at the same academic stage, **PhD** participants indicate attending an above average number of conferences
Fall 2011: Continuing Students

- **Graduate (PhD)** participants more likely to maintain contact with people outside their home institutions they met at technical and diversity conferences

  - Email or social media
  - Ask technical questions
  - Develop friendships
  - Career options and advice
  - Gather information about internships, research opportunities, etc.
  - Offer advice or information about opportunities
Fall 2011: Continuing Students

- More frequently than non-participants, **Graduate** participants had more professional publishing experiences
  - **PhD** participants were authors or co-authors of conference papers
  - **Master’s** participants had papers or presentations in progress
Next Steps

• Continuation of surveys
  – Spring
  – Fall
  – Follow-up
  – Faculty

• In-depth analysis
  – More regression or ANOVA
  – Specific topic, e.g. REU experience
  – Multiple years: aggregate/longitudinal
  – ?
Data Buddies Vision

• Potential as a resource for both the Computing and Broadening Participating communities
• Needs the resources to support it: how to make it sustainable
• Wealth of data: how to best partner with others on analysis
For more information

• See [www.cra.org/databuddies](http://www.cra.org/databuddies)
  – Initial report on spring 2011 data collection
  – Sample department report
  – Information on being a volunteer department is there as well

• Or email [databuddies@cra.org](mailto:databuddies@cra.org)

QUESTIONS?