Moving Mountains: The Impact of the Southeast Regional PULSE Initiative on Twenty Diverse Institutions Engaged in Department-Wide Undergraduate Biology Reform

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**PULSE in the Southeast**

The Partnership for Undergraduate Life Sciences Education (PULSE) is working to catalyze department-level reforms called for in Vision and Change in Undergraduate Biology Education: A Call to Action.

With support from NSF (EAGER #1435389) and HHMI, the Southeast Regional PULSE (SERP) Leadership Fellows engaged teams from twenty diverse institutions in a yearlong project, which included participation in the Southeast Regional PULSE (SERP) Institute in June 2014.

**Hypothesis of PULSE/SERP Project:** Reform initiatives (e.g., Vision and Change) that target the department as the unit of change can reform academic systems.

**Methods**

Team attendance at the 3.5 day SERP Institute
- Department Chair
- Upper Administrator
- up to three additional faculty members

Targeted invitation strategy to ensure institutional diversity

Use of the STEM Department Evaluation Rubric

A rigorous pre/post-Institute Assessment Protocol

**Assessment Protocol: Seven Tools**

- SERP Institute Application
- Pre-Institute Survey
- Post-Institute Survey
- Team Action Plans
- Follow-up phone interviews
- Posters and Reports at ASB*

*Year-End Survey of SERP Project

**Participating Institutions**

Invitations to apply to the Institute went to 70 schools chosen randomly from the list of SACS-COC schools based on:
- Equal number of each Carnegie type
- A target of 30% minority-serving institutions (MSI)

Invitations went to the chief academic officer and Chair of life science (or equivalent) at each institution.

**STEM Department Evaluation Rubric**

The STEM Rubric* was used by participants in a pre-Institute Survey to evaluate their department and identify priorities and challenges. The topics of the Institute's workshops and plenary sessions then addressed each Rubric factor. The STEM Rubric is available at [http://www.pulsecommunity.org/page/assessment](http://www.pulsecommunity.org/page/assessment).

**Sample of Pre-Institute Survey Results**

- Perceptions of starting state tended to be lower for Course-Embedded Research (e.g., Fig. 2a), Engaging Pedagogies, and developing students’ Metacognitive Skills, whereas ratings for Independent Research and Integration of Departmental and institutional goals were generally higher (results not shown).
- Agreement among team members (low statistical variance) was tight for some factors (Fig. 2a) but high for others, such as Assessment (Fig. 2b).

**Post-Institute Survey:**

- **“The support and collective wisdom of this group is unlike any other I have ever attended, and this is from a consultant in faculty and academic development who has attended numerous such meetings. The schedule is challenging but the excitement level and enthusiasm that was sustained was nothing short of amazing! It was the most uplifting experience I have ever had at such an institute!”**

**Year-End Survey:**

- “Being selected as one of the institutions for the SERP Institute has been one of the best things that has happened to our department, [we brought] back information that helped get the entire department on board.

- “…knowing the other schools were working toward the same goals really helped to inspire us. Being community college faculty, we often feel left out of big initiatives like these. It was awesome being [an equal] at the table [with] faculty from R1 institutions.

- “PULSE has been a great catalyst for departmental improvement. The fact that the SERP Institute invited not only faculty members but upper administrators really helped to keep the momentum going once returning to campus…now we are looking at reform throughout the Science Division, not just biology.”

Figure 4a&b. Sample results from Pre-Institute Survey in which team members rated (x variance) their department. The number of team members that completed the survey is indicated in parentheses. Each institution is depicted by a code letter to protect confidentiality. 73 of the 86 participants completed the survey. Graphs for two factors are shown; graphs for other eight factors are available upon request.

Figure 5. This graphic shows how much progress the participants (n = 67 of 86) perceive their departments have made on each of the Rubric’s factors since attending the SERP Institute one year ago. If they did not target their efforts to a particular factor, they could choose not applicable.

**Sample of Year-End Survey Results**

**Conclusions**

- Our results support the hypothesis that efforts that target the department as the unit of reform will be successful in driving change.
- Evidence indicates that attending a dynamic Institute as a team (that includes the Chair and an upper administrator), developing a shared Vision and Action Plan for reform, sharing those plans and tools with colleagues, and becoming part of a supportive regional network can lead to substantial, department-wide improvements in a fairly short period of time.
- The SERP project fostered leadership development, from the grassroots to the chair level.
- Organizers of other undergraduate education reform initiatives will likely find approaches used in this project to be broadly applicable and adaptable.