

The Partnership for Research and Education in Materials (PREM):

Highlights and Successes from the California State University Los Angeles (CSULA)/Caltech Collaboration

Robert de Groot, Frank Gomez, and Harry Atwater



what is a partnership for research and education in materials (prem)?

The objective of PREM is to enhance diversity in materials research and education by stimulating the development of formal, long-term, collaborative research and education partnerships between minority-serving colleges and universities and the NSF Division of Materials Research (DMR)-supported centers and facilities.



mission of csula/caltech prem

The mission of the CSULA/Caltech PREM collaboration is to enhance and promote diversity in materials science research and education in the Southern California area by fostering and nurturing interdisciplinary interactions between faculty and students at CSULA and Caltech that advance the discovery and understanding of new materials.



since 2004 csula/caltech prem has engaged

- 15 high school students (los angeles usd district 5 & bosco tech) (8 weeks over summer)
- 25 university students (all year)
- 11 faculty members from caltech and csula
- 20+ graduate students and staff at caltech and csula (including csem education director)



why evaluate prem?

- document the program (i.e. tell the story of the program)
- learn how improve the program from year to year. (e.g. identifies successes and areas of improvement)
- have data to determine outputs and outcomes of the csula/caltech program at the end of the funding period.*
- Information for reporting to the funding agency (NSF)
- Provides data for renewal proposal

*Since this is a small group outcomes might be best determined through qualitative methods (e.g. ethnography)



interesting questions

- academic and career goals of the students
- how they overcome research challenges using scientific methods
- how the summer experience (~8 weeks) changes their attitudes toward research and a research based education
- understand the students (especially hs) preconceptions about how science and engineering research is done
- interactions between student researchers with peers and other members of a research team (including faculty)



setting the scene

- met with students to explain to explain what evaluation is, why it is important, and how it will be done (for HS adult guardian is present and necessary release paperwork is provided)
- program director explains that completion of evaluation activities is important and is tied to stipend
- evaluation activities must have a minimum impact on research activities
- evaluation activities provide an opportunity for the student to be introspective
- evaluation activities complement research activities and/or contribute to one's cv



evaluation data sources

- personal statement (submitted during first week of research)
- site visit (including taking images in the environment) For HS students 2 site visits with talk - second with college mentors
- research abstract (ACS format)
- research presentation (standard conference length)
- experience statement (similar to personal statement and they are paired to see changes throughout the summer)

college only

- broader impacts activity (2006-)
- weekend retreat (2006-)
- acs career workshop (2006-)
- research highlight (2007-)

hs only

- in class presentation at school site



preliminary outcomes

- hs - school science vs. real science
- hs - learning and using specialized vocabulary
- hs - working in a collegial environment
- hs & college - clarification of career trajectory
- hs & college - challenges in communicating to experts and non-experts
- hs & college - using specialized equipment



quotables

"Working with others at first proves to be kind of hard for me because I'm shy at the beginning. During this summer I learned to ask questions, which helped me get over my shyness. I was able to learn how to present and take criticism which I had rarely before. I thank this program for all I have learned." -Paola (HS - ES)

"Thanks to this program I was able to learn many important lessons. The very first of these I would have to say was learning scientific vocabulary. Many of the words I learned had never heard of. Another lesson that I learned was how to use various machines for example the spin coater, mask aligner, and others. -Rocio (HS-ES)



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thank you

