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California State Polytechnic University, Pomona  
Tatevik Sardaryan, Felix Villa, Paulo Osuna, Edwin Salazar, Sergio Gonzales  
California State University of Northridge

## Abstract

STEM-Hispanic Serving Institution (HSI) grants are funded by the United States Department of Education under Title III STEM/Part F-HSI. These grants fund various Science, Technology, Engineering and Math projects in colleges and universities throughout the country.

A problem faced by grant receiving institutions is that there has never been ways for grant directors to communicate with each other in a centralized way. In order for ideas to be shared amongst grantees, a communication channel between them was needed.

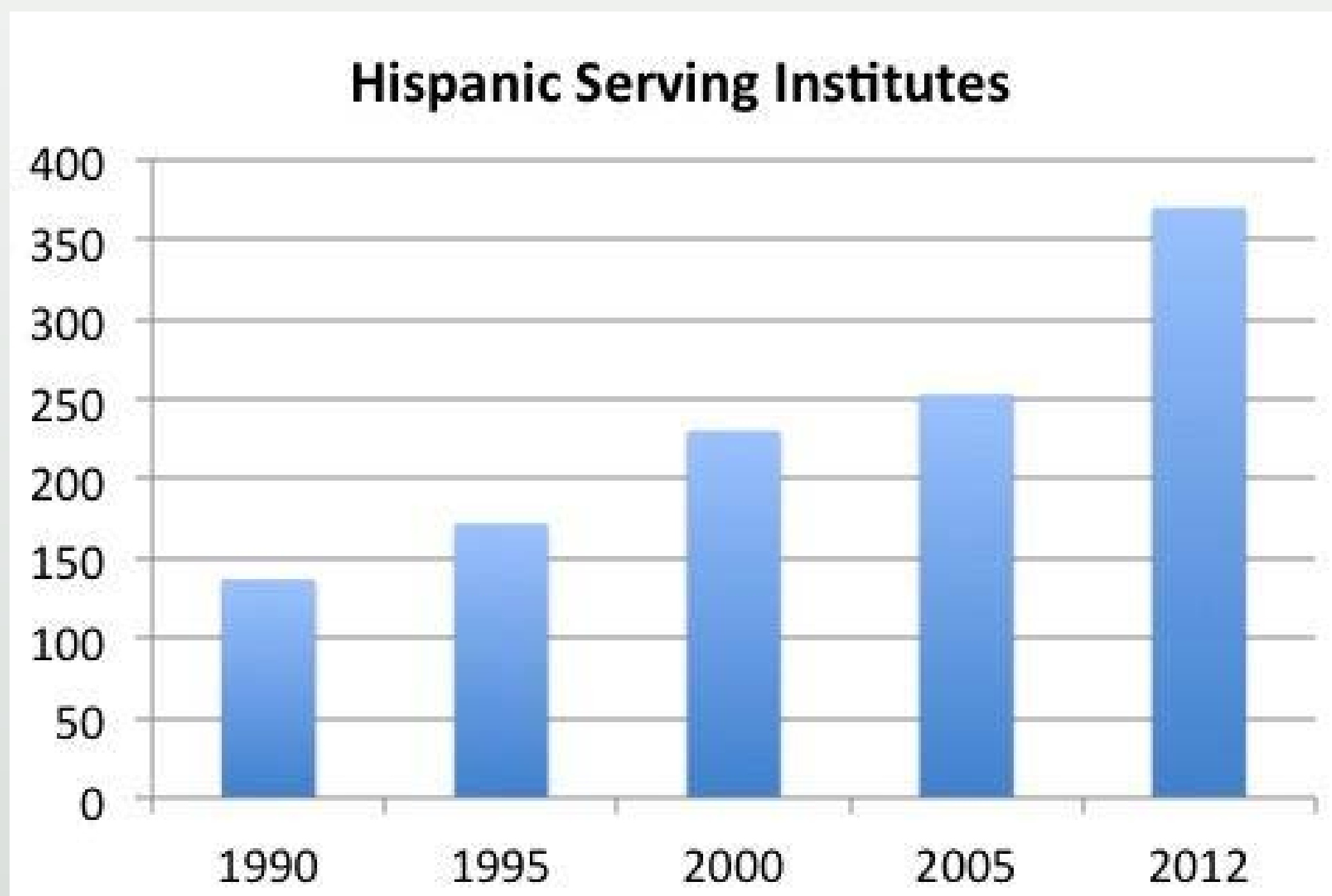
Thus, the creation of a system that categorized STEM grantee objectives into type of projects, successful strategies, and assessed versions of successes and failures was created to provide valuable information for all STEM grantees and minimize redundancies collectively within the programs. Successful objectives and strategies can now also be collected as a group to assess their overall STEM program productivity.

In short, the purpose of the HSI-STEM web portal is to serve as a communication link between STEM-HSI grantees. It allows grantees and directors to view and share grant objectives and goals between them, thus, stimulating the creation of new exciting STEM projects.

## Introduction

### HSI-STEM Grantee Interaction

- Creates a communication link between HSI-STEM PIs that allows them to share their program objectives and results.
- Collection of data will stimulate the creation of new exciting STEM projects.
- The number of HSIs is rapidly growing, from 137 institutions in 1990 to 172 in 1995, to 230 in 2000, to 253 in 2005, and 370 in 2012.



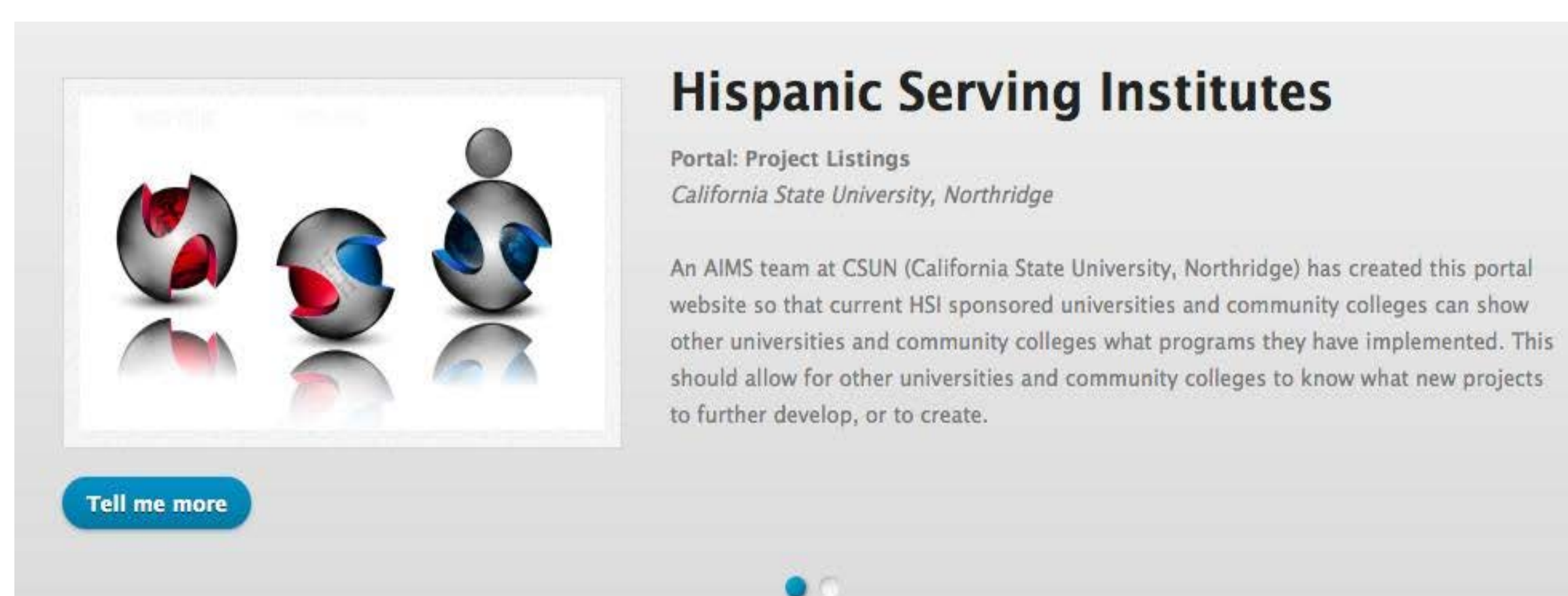
### Group Motivation

Our desire to engage in a project that could allow for the sharing of information between STEM supporting colleges and universities.

## Results

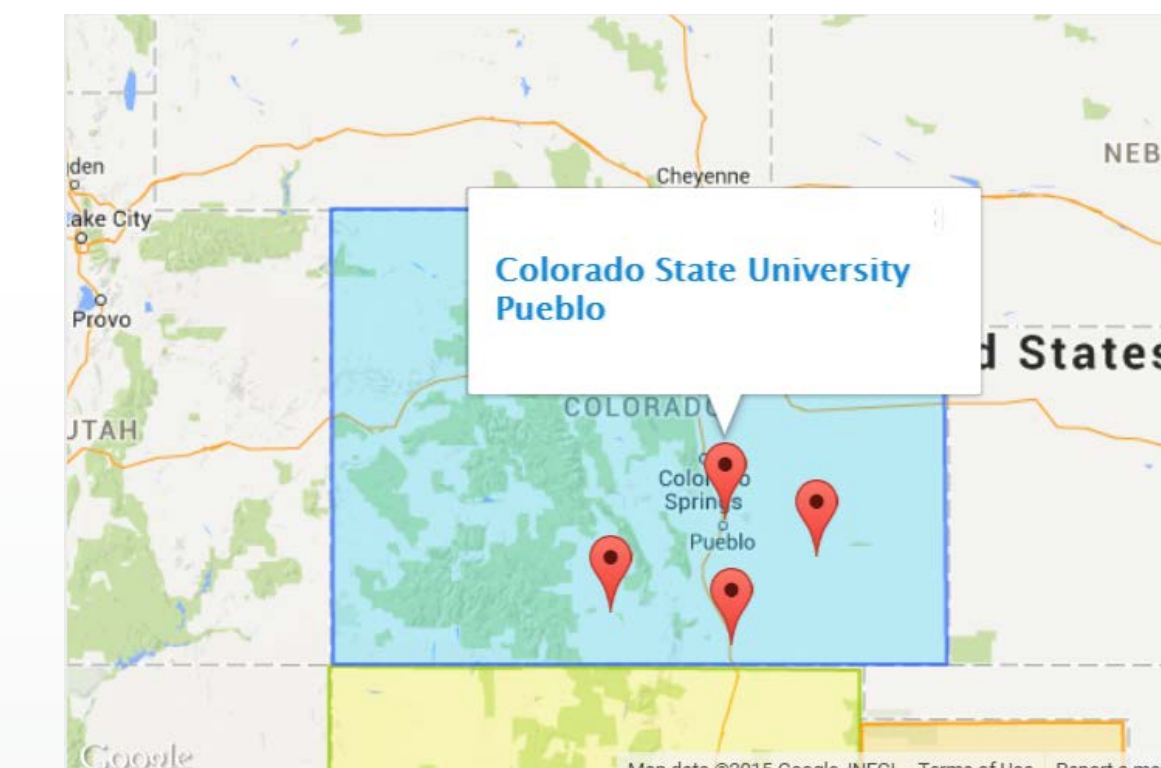
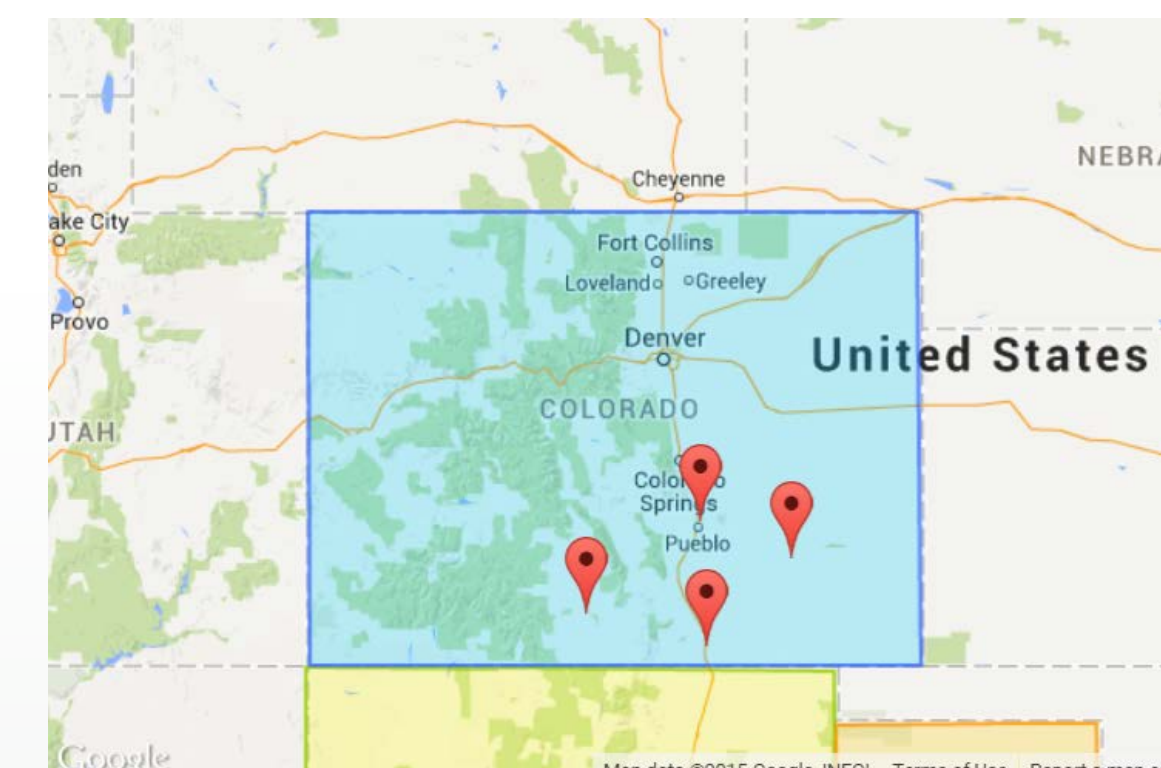
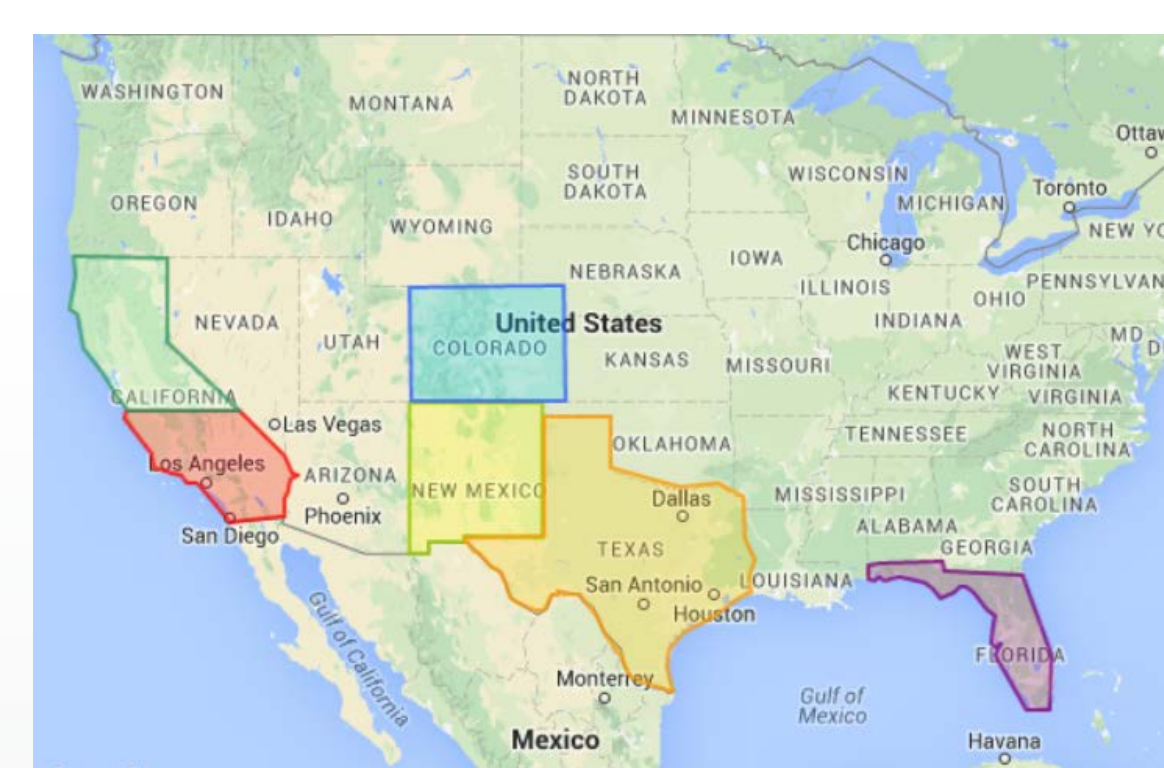
The HSI Web Portal acts a virtual library where Principal Investigators may share their STEM projects. The Portal also provides a real-time chat communication link between PIs. Thus, the HSI Web Portal acts as a one-stop solution for gathering and exchanging information about the HSI grantees and their projects, as well as a form of communication.

Additionally, there is a geographic navigation map where PIs can graphically browse between school projects, and there is also a search box option that allows for project searches by keywords or other identifying data.



### About Drupal CMS

Drupal is an open source content management platform powering millions of websites and applications. It's built, used, and supported by an active and diverse community of people around the world.



## Discussion

### Features of the Web Portal

The updated version of the STEM-HSI Web Portal includes a full functioning chat module that will allow logged in users to have a conversation in a private one-on-one room, or with multiple users logged into a public chat room. The chat function makes a copy, and retains the conversation for future use. It also has an improved integrated map that pinpoints the school locations for those schools who input their data, and serves as a navigational tool for locating schools by region.

A section of the website that shows grantees how to use the HSI portal website has been implemented as well. This section provides grantees with a menu containing categorized information about the site's overview, navigation, and its features. Help videos are also available here. Bug reports and troubleshooting are handled via an e-mail form that directs to the current website administrator.

### Possible Optimizations

At present, PIs are not able to engage in group conversations outside of the public chatroom. This is a feature that may bring more collective functionality between institutions. Other features that may add productivity to the site are file upload/download capabilities (PDFs) for PIs.

### Technical Aspects

The web portal's content is managed by Drupal, and is currently hosted at CSUN. The web address is <http://www.ecs.csun.edu/~hsi>. The navigation map was created using the Google Maps JavaScript API Version 3.

## Conclusion

- HSI Web Portal works well with most web browsers.
- The Portal is easy to use, there is only a small learning curve
- The posting of STEM projects is done through the use of a template, however, it is flexible enough that it allows for PIs to upload graphics and other data as well
- Overall, the Portal is a success as it provides the basic functionality of the creation of user accounts, the uploading of STEM projects, the sharing of the projects, cataloging them, and providing communication avenues between users
- Future Implementations:
  - a. Organize Chat Groups
  - b. Allow projects to be downloaded
- The team met their desire to engage in a project where several skill-levels were necessary to succeed.
- Each individual member of the team practiced cooperation and learned valuable technical skills. As a result, each member was able to culminate their independent research through application, leading to the creation of this portal.

## Participants

Tatevik Sardaryan  
Felix Villa  
Paulo Osuna  
Edwin Salazar  
Sergio Gonzales

## Limitations

The following are a list of browsers known to work and support all of the HSI-STEM Portal website features:

- Internet Explorer 8.x and later
- Internet Explorer 9.x and later
- Firefox 5.x and later
- Opera 12 and later
- Safari 5.x and later
- Google Chrome

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HSI-STEM

## Contact Information

Gloria Melara  
Gloria.melara@csun.edu

April 7-8, 2015 California State Polytechnic University, Pomona

Dr. Robert G. Ryan, Dr. Nathan R. Durdella, Mr. Christopher Lawrence  
California State University, Northridge

## Abstract

In 2011, the College of Engineering and Computer Science (CECS) at California State University, Northridge (CSUN) received a five-year, \$5.5 million dollar HSI-STEM grant from the Department of Education to address the challenges faced by transfer students from under-represented groups. Glendale Community College (GCC) and College of the Canyons (COC), two local community colleges, are partners in the grant. The main goals of the grant are to recruit promising students from community colleges, and then provide them with financial and academic support to ensure their success. There are also opportunities to work on summer research projects under the guidance of their faculty mentors. Many of the students that entered the program have now graduated.

Evaluation of program effectiveness is measured by a variety of methods, including quantitative measures of academic progress versus a control group of non-participants, collection and interpretation of monthly student online journals, and analysis of detailed interviews with selected students. Quantitative results show that participants in the program have higher transfer and completion rates than students in the control group.

## Introduction

The three objectives of the AIMS<sup>2</sup> program (Attract, Inspire, Mentor, and Support Students), are:

- To increase the number of Hispanic and low-income students who transfer from the community college partner institutions to pursue STEM degrees at our institution
- To assist these students to successfully graduate with a STEM degree in a timely manner
- To streamline the transfer process between the community college partners to our institution by expanding existing articulation agreements

Students in the program at CSUN are provided with faculty and student mentors, tutors, and a stipend. Each annual cohort at CSUN is approximately 30 students, selected through an application process. Regular meetings are held between the students and their mentors to monitor academic progress and establish a sense of community. Opportunities for working on research projects with the faculty mentors are provided, especially during summer.

A similar structure exists at each of the community college partners. The nominal size of the cohorts at the community colleges is 15 students. Field trips and attendance at conferences are emphasized to enhance the students' professional growth. Community college participants in the program are guaranteed acceptance into the program at CSUN.

Monthly meetings among CSUN and CC staff and faculty ensure good communication among the partners and assist with the program assessment process.

## Assessment Methods and Results

### Framework, Procedures, and Methods

Project objectives guided the evaluation as an embedded mixed methods case study design, with the goal of assessing performance measures with baseline and project performance data at each campus.

Data Sources: Students, faculty, staff, and institutional data

Data Collection Procedures: Journals, surveys, interviews

Interview Procedures: 60 minute, semi-structured personal interviews with student consent; audio recordings were transcribed and comments were parsed into themes; topics covered include student interests, level of participation and challenges related to research with faculty, and general interaction with student peers and faculty mentors

Analysis Procedures: Frequency and thematic data analysis

### Quantitative Results (2013-2014)

#### Transfer Achievement from Community College Partners

Baseline number of transfer students from GCC/COC who entered into a CECS major was 21 in 2010-2011

Defined program target for annual number of transfers is 36

64 new transfer students from GCC/COC entered into a CECS major in 2013-2014 ( 305% of the baseline number and 178 % of the project target)

#### Program Completion Rates for Students in the Program

Baseline completion rate for Hispanic and low-income students from 2010-2011 was 26%

Defined program target is to increase the completion rate to 30%

Program completion rate was 39.2% for 2013-2014

### Qualitative Results (2013-2014)

Seven qualitative measures were used to assess quality of peer-peer interaction, student-faculty interaction, and research participation

All seven measures indicated improvement over previous years

### Interview Excerpts (2013-2014)

"If I wasn't in AIMS<sup>2</sup>, I wouldn't have done the research project"

"Prof X gave us advice and told us what we needed to do and asked how we were doing"

"I always sought guidance from Prof Y. Prof Y was kind of like the person to go to if I had any issues or any problems. I'm not able to take this class, what can I do? Prof Y would offer different suggestions, different paths I could take.

## Conclusions

### Project Strengths

Student contact with faculty mentors in cohort group meetings, research activities, and informal meetings

Peer interaction in the form of peer mentoring and tutoring

Measured improvements in transfer and program completion rates

### Areas for Improvement

Peer mentoring across campuses, i.e. CSUN student contact with GCC/COC students, needs more attention and focus

Plans for students at GCC/COC to take on-line courses at CSUN were never implemented

## Special Recognitions

The AIMS<sup>2</sup> program received an Honorable Mention Award as an Example for *Excelencia* in the Baccalaureate Category (<http://www.edexcelencia.org/2014>)

## Funding

The CSU, Northridge Engineering and Computer Science HSI-STEM Initiative was funded by the United States Department of Education FY 2011 Title III, Part F, Hispanic-Serving Institutions (HSI) STEM and Articulation Programs cooperative arrangement development five-year grant, Award Number P031C110031, CFDA Number 84.031C .

## Principal Investigator

The P.I. of the project is Dr. S.K. Ramesh, Dean of the College of Engineering and Computer Science at California State University, Northridge



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## Contact Information

Dr. Robert Ryan – [robert.ryan@csun.edu](mailto:robert.ryan@csun.edu)  
Dr. Nathan Durdella – [nathan.durdella@csun.edu](mailto:nathan.durdella@csun.edu)  
Mr. Christopher Lawrence - [christopher.lawrence.40@my.csun.edu](mailto:christopher.lawrence.40@my.csun.edu)