The AIMS² (HSI-STEM Grant)
CSU Northridge, Glendale CC, College of the Canyons

S. K. Ramesh, Jan Swinton, Gloría Melara, Vidya Nandikolla

Sep 12, 2015
The CSU, Northridge Engineering and Computer Science HSI-STEM Initiative is 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 is a collaborative project lead by the College of Engineering and Computer Science, in partnership with Glendale Community College (GCC) and the College of the Canyons (COC).
AGENDA

• Self Introductions of Panelists - All
• Overview of the AIMS² grant program – Ramesh
• Community College Collaboration – Jan Swinton
• Curriculum / Faculty Development – Gloria Melara
• Student Development – Vidya Nandikolla
• Q & A and discussion with Panelists
• Closing Comments - Ramesh
Student Success is our #1 Priority

CSUN’s undergraduate engineering programs were recognized for being the fastest growing in the nation in the 3 years from ‘05-’08 (96% growth)- ASEE March 2010

<table>
<thead>
<tr>
<th>School</th>
<th>Growth in Bachelor’s Degrees</th>
<th>B.S. Degrees: 2008</th>
<th>B.S. Degrees: 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. California State U., Northridge</td>
<td>96%</td>
<td>190</td>
<td>97</td>
</tr>
<tr>
<td>2. South Dakota State University</td>
<td>82%</td>
<td>162</td>
<td>89</td>
</tr>
<tr>
<td>3. California State U., Long Beach</td>
<td>70%</td>
<td>350</td>
<td>206</td>
</tr>
<tr>
<td>4. University of Texas, Arlington</td>
<td>59%</td>
<td>295</td>
<td>186</td>
</tr>
<tr>
<td>5. Univ. of California, Riverside</td>
<td>57%</td>
<td>182</td>
<td>116</td>
</tr>
<tr>
<td>6. City College of the CUNY</td>
<td>54%</td>
<td>249</td>
<td>162</td>
</tr>
<tr>
<td>7. SUNY — Binghampton</td>
<td>49%</td>
<td>218</td>
<td>146</td>
</tr>
<tr>
<td>8. University of Connecticut</td>
<td>44%</td>
<td>272</td>
<td>189</td>
</tr>
<tr>
<td>9. Syracuse University</td>
<td>43%</td>
<td>173</td>
<td>121</td>
</tr>
<tr>
<td>10. George Mason University</td>
<td>42%</td>
<td>317</td>
<td>224</td>
</tr>
</tbody>
</table>

*excluding all computer science
Schools must have awarded at least 75 B.S. degrees in 2005. 215 schools met this criterion.

Degrees Granted

Headcount Enrollments - 2006-2014

August 2015

CECS_Ramesh
Areas of Strength

- Energy
- Materials
- Manufacturing
- Robotics
- Communications
- Software Engineering
- Entrepreneurship

College Profile

- 4,900 students (750 graduate) in five departments
- 9 Undergraduate and 9 Graduate Degree Programs
- Approx. 550 graduates/year with almost 50% receiving Masters degrees
- 62 T/TT faculty including 27 new hires from 2011-15
- College-Based Centers
  - Ernie Schaeffer Center for Entrepreneurship and Innovation
  - Center for Engineering and Computer Science Research and Education
  - Energy Research Center

Approximately $2.5 M/year in Grants & Contracts
AIMS²
Attract, Inspire, Mentor and Support Students

- Glendale Community College
- CSU Northridge College of Engineering and Computer Science
- College of the Canyons
- HSI-STEM Advisory Board
- Program Assessment and Evaluation Committee
- Civil Engineering and Construction Management
- Computer Science
- Electrical and Computer Engineering
- Manufacturing Systems Engineering and Management
- Mechanical Engineering
The AIMS² Project Team
Attract, Inspire, Mentor, and Support Students

Faculty and Staff from the College of the Canyons, Glendale CC, & the College of Engineering and Computer Science, CSUN
Goals and Objectives

• To increase the number of Hispanic and low-income students who successfully transfer from Glendale Community College (GCC), and College of the Canyons (COC) to California State University, Northridge, to pursue majors in Engineering and/or Computer Science.

• To increase the number of Hispanic and low-income students who join CSUN as upper division transfer students and graduate with degrees from one of the undergraduate programs in the College of Engineering and Computer Science.

• To develop a model, seamless and sustainable transfer program to assist Hispanic and low-income students to successfully transfer from GCC and COC to California State University, Northridge where they will complete their studies in Engineering and/or Computer Science.
Project Activities

- Tutoring to improve student performance in preparatory Math and Science courses.
- Advising and tracking of students in cohort
- Work closely with faculty and staff in feeder community colleges to develop seamless articulation agreements, especially for students transferring from 2 year colleges to CSUN.
- Create a mobile digital environment with Tablet PCs, iPad’s, and appropriate software, so that the project team can work with the cohorts to enhance communication, engagement, collaboration and creativity, and instant learning assessment.
- Expand Facilitated Academic Workshops (FAW) in required introductory courses and key upper division courses offered by the college’s programs
- Faculty/Peer mentoring and career advising of students in the cohort
- College wide events focused on careers and jobs such as the biannual Tech Fest events held in February and September.
- Provide students with opportunities to work on hands-on projects and research activities that encourage them to stay connected with their majors
Nuts and Bolts

- All cohort students meet regularly as a group with faculty mentor and peer mentor from their respective program.
- All cohort students maintain an online journal using Moodle with submissions required on a monthly basis – responses to prompts and additional information.
- All faculty mentors maintain an online journal with submissions required once/semester.
- Lead project faculty from GCC, COC, and CSUN meet regularly to address gaps in articulation agreements and collaboratively develop curriculum to address gaps.
- Monthly meetings of the entire team to review progress on key project measures and activities.
- Annual meeting with External Advisory Committee.
- Bi-annual gathering of the cohorts at partner colleges to promote interaction.
Cohort 5
External Advisory Committee

- Ms. Rupa Dachere, Codechix
- Ms. Roslyn Soto, JPL
- Dr. Vaughn Cable, JPL
- Mr. Luis Carbajo, IEEE LA Council Vice Chair
- Ms. Linda Friedman, Northrop Grumman, Woodland Hills
- Mr. Neal Gaborno, Raytheon
- Mr. Bill James, Avery James Inc.
- Prof. Miguel Macias, Emeritus faculty CSUN
- Mr. Tony Magee, PWR
- Mr. Michael Medina, Hill International, San Diego
- Dr. Rick Ratcliffe, Dean emeritus CSUN
Students served to date

• Since January 2012 we have served a total of over 200 students in three cohorts (approximately 67 % Latino/a). This includes first-time transfer students at CSUN, and students who transferred from our partner institutions at GCC, and COC.
“This year’s Examples of Excelencia and finalists are at the forefront of meeting the challenge of improving higher educational achievement for Latino students,” said Sarita Brown, president of Excelencia in Education. “No longer should policymakers and institutional leaders ask how to improve college success for Latinos – we have the largest accumulation of proven examples and tested strategies that show them how. Today’s question is do leaders have the will to put these practices into action.”

• U.S. Rep. Tony Cárdenas (San Fernando Valley, Calif.) brought greetings on behalf of the Congressional Hispanic Caucus. He congratulated Excelencia in Education and the Examples of Excelencia program, highlighting the California State University, Northridge's Engineering and Computer Science HSI-STEM Initiative, an institution from his congressional district who received recognition as an Honorable Mention in the bachelor's degree category. Cárdenas urged the audience never to pass up an opportunity to mentor Latino students toward success.

Excelencia Foundation Recognition: 9/30/14

Anwar, Ramesh, Sarah, Richard (above)
Richard, Bruno, Anwar, Ramesh (below)

Congressman Cardenas’ remarks
President Sarita Brown looks on

https://www.youtube.com/watch?v=I0Fzz-1t78s&list=PLi-dqTm4tmeEG9SabKxNd75UJl4s3UHBK&index=3
White House STEM Workshop

- CSUN hosted one of the four national workshops on October 7, 2014
- Focused on College Opportunity and broadening participation in STEM
- Supported by the Helmsley Trust and the White House OSTP
- President Harrison invited to White House STEM Summit on December 4, 2014
Student-Faculty Interaction
Conclusions on Performance to date

- In general, advising, activities, workshops, and faculty research are project strengths.
- Overall, frequent and consistent student-faculty interaction tends to have the strongest effects on student experiences.
- Finally, peer interaction in the form of peer mentoring and tutoring appear to have strong, positive effects on student transitions, learning.
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Glendale Community College
AIMS²
A total of 51 low-income (98% BOG eligible) GCC STEM students participated in the AIMS\textsuperscript{2} program (2012-present)

- Cohort 1 ($n=13$), Cohort 2 ($n=13$), Cohort 3 ($n=11$), Cohort 4 ($n=14$)
- Female ($n=20$), Male ($n=31$)
- Average GPA amongst all 4 cohorts is 3.11 vs. 2.6 (comparison group)
- Majors included: Computer Science, Physics, Aerospace, Civil, Computer, Electrical, Manufacturing, Mechanical, and Structural Engineering.
- Thus far, 28 students have transferred to: CSUN ($n=17$), Cal Poly Pomona ($n=5$), UC Berkeley ($n=3$), CSULA ($n=1$), UC Irvine ($n=1$) & UC Santa Barbara ($n=1$)
## Performance by Cohort

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Spr 12</th>
<th>Fall 12</th>
<th>Spr 13</th>
<th>Fall 13</th>
<th>Spr 14</th>
<th>Fall 14</th>
<th>Spr 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.91</td>
<td>3.05</td>
<td>2.95</td>
<td>2.11</td>
<td>M=11.71 units carried</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=13)</td>
<td>(n=12)</td>
<td>(n=10)</td>
<td>(n=7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>3.09</td>
<td>3.00</td>
<td>3.09</td>
<td>3.36</td>
<td>M=12.84 units carried</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=13)</td>
<td>(n=13)</td>
<td>(n=11)</td>
<td>(n=10)</td>
<td>(n=10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3.38</td>
<td>3.43</td>
<td>3.14</td>
<td>2.74</td>
<td>M=12.83 units</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=8)</td>
<td>(n=11)</td>
<td>(n=10)</td>
<td>(n=10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M=11.22 units carried</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.83</td>
<td>(n=14)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.67</td>
<td>(n=14)</td>
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</tbody>
</table>

**Comparison groups**

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Spr 12</th>
<th>Fall 12</th>
<th>Spr 13</th>
<th>Fall 13</th>
<th>Spr 14</th>
<th>Fall 14</th>
<th>Spr 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.58</td>
<td>2.57</td>
<td>2.59</td>
<td>2.59</td>
<td>M=7.86 units carried</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=14,828)</td>
<td>(n=14,962)</td>
<td>(n=15,085)</td>
<td>(n=14,549)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>2.57</td>
<td>2.59</td>
<td>2.59</td>
<td>2.63</td>
<td>M=7.83 units carried</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=14,962)</td>
<td>(n=15,085)</td>
<td>(n=14,549)</td>
<td>(n=14,115)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>2.59</td>
<td>2.59</td>
<td>2.63</td>
<td>M=7.88 units</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(n=15,036)</td>
<td>(n=14,549)</td>
<td>(n=14,115)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M=7.91 units carried</td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>2.59</td>
<td>(n=15,036)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.63</td>
<td>(n=14,054)</td>
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</tbody>
</table>
## Closing the GAP: GCC/CSUN Articulation Agreements Enhanced

<table>
<thead>
<tr>
<th>CSUN Course Name/#</th>
<th>Course Title</th>
<th>GCC Course Name/#</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIT 101/L</td>
<td>CIT Fundamentals w/lab</td>
<td>CS/IS 101</td>
<td>Intro to Computer Info Systems</td>
</tr>
<tr>
<td>CIT 160/L</td>
<td>Internet Technologies w/lab</td>
<td>CS/IS 260</td>
<td>Intro to Website Development</td>
</tr>
<tr>
<td>COMP 108</td>
<td>Orientation to Computer Science</td>
<td>CS/IS 112</td>
<td>Intro to Programming using JAVA</td>
</tr>
<tr>
<td>COMP 122/L</td>
<td>Computer Architecture &amp; Assembly Language</td>
<td>CS/IS 165</td>
<td>Computer Architecture &amp; Assembly Language</td>
</tr>
<tr>
<td>ME 186/L</td>
<td>Computer-Aided Design w/lab</td>
<td>ENGR 111</td>
<td>Solid Works Applications</td>
</tr>
<tr>
<td>CE 240/L</td>
<td>Engineering Statics</td>
<td>ENGR 152</td>
<td>Engineering Mechanics-Statics</td>
</tr>
<tr>
<td>ECE 240/L</td>
<td>Electrical Engineering Fundamentals</td>
<td>ENGR 140</td>
<td>Electrical Engineering Fundamentals (pending)</td>
</tr>
<tr>
<td>MSE 227/L</td>
<td>Engineering Materials w/lab</td>
<td>ENGR 146</td>
<td>Engineering Materials (pending)</td>
</tr>
<tr>
<td>ME 209</td>
<td>Programming for Mechanical Engineers</td>
<td>Engr 156</td>
<td>Programming &amp; Problem Solving in MATLAB</td>
</tr>
</tbody>
</table>
Project Activities

- Naval Air Base (San Diego)
- Burbank Water & Power
- JBL/Harman field trip
- Great Minds in STEM Conf
- CSUN Speed Mentoring
- SHPE National Conference
- Calif. Science Museum
- Golden Road Brewery
- CSUN Research Program
- Jet Manufacturing Firm
- Jet Propulsion Lab (JPL)
- Latinas in STEM conf
- Society of Women Engineers Conference
- CSUN Tech Fest
- IPAD trainings
- Boeing field trip
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Support Model

• Collaboration CSUN and CC faculty:
  – Facilitating a channel for face to face discussion on curriculum issues among CSUN and CC faculty teaching transferable courses.
  • Promote discussion on learning outcomes, resources, and best practice
  • Build trust to create further collaboration
  • Challenges to overcome
Collaboration with CC faculty:

- Facilitate a channel for face-to-face discussion on curriculum issues among CSUN and CC faculty teaching transferable courses.
- Success on articulation
  - Avoids waste of resources
  - Avoids confusion
  - Facilitates advising
  - Faster track to graduate
Computer Science

- 21 students in computer science
  - 8 students have graduated Spring 15
    - 6 students on professional jobs
    - 2 students continue higher education
  - 10 students plan to graduate Fall or Spring 16
  - 3 students plan to graduate Spring 17
Synergistic Activities: AAC&U TIDES Grant

- Ani Nahapetian, and Gloria Melara (Comp. Sci), and Ric Elviso (Music)
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Student Development

• Undergraduate research
  – Multidisciplinary team
  – Other Teams: Mechanical, Electrical, Computer, Civil, Management, Manufacturing, Biomedical engineering teams

• Student support

• Career preparation
Student Development

• Multidisciplinary undergraduate research
• Autonomous Drone
• Student mentor
• Student tutors
• Weekly/biweekly meetings
• Meetings via appointments
• Advising
• Maintain minimum requirements for scholarship
Career Preparation

- Resume Workshops
- Tech Fest preparation / Career Day
- Research Presentations
- Attending conferences
- Conference / poster publications
- Nov 12th – AIMS² Research Symposium
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Dear Colleague,

On behalf of the White House Initiative on Educational Excellence for Hispanics (Initiative), thank you for answering the call for Bright Spots in Hispanic Education.

I am pleased to notify you that the Bright Spot nomination you submitted has been accepted for recognition through the Initiative’s Anniversary Year of Action. Your Bright Spot will be publicly recognized on Tuesday, September 15, 2015 and will be included in the Initiative’s first-ever National Bright Spots in Hispanic Education online catalogue. We will be in touch by the end of this week with amplification tools and resources, but please hold off in publicly announcing the acceptance of your Bright Spot (i.e., emails, press, social media) until we provide additional guidance.

Congratulations and thank you for your leadership, dedication and steadfast commitment to the Hispanic community. I look forward to celebrating the tremendous progress Hispanic students have made in education over the last 25 years and recognize the leaders, parents and educators who have supported them along the way.

Thank you,

/s/

Alejandra Ceja
Executive Director
White House Initiative on Educational Excellence for Hispanics
Thank you for your attention!

Questions?

Project URL:
http://www.ecs.csun.edu/aims2

Jacaranda Hall- Courtesy Prof. Steven Stepanek