Sacramento City College

Sacramento City College seeks to create a learning community that celebrates diversity, nurtures personal growth, and inspires academic and economic leadership.
Program History

• Leadership’s call for efforts to improve student outcomes
• Identification of improvement opportunities
• Build on long standing partnerships
• Contextualize & linking as core success strategy
• Faculty Learning Community as sustainable change agent
• Seed funding by Health Workforce Initiative
• CCCLLI provides broader context, evaluation and expertise
Program Mission

Accelerate degree and certificate completion through improved academic success in Allied Health prerequisite courses.
Design Goals

• Two-year suite of linked courses leading to multiple allied health career options and A.S. degree

• A cohort based, learner-centered pedagogy emphasizing authentic allied health practice & problem solving

• Sustainable under current financial and institutional realities
## Results

<table>
<thead>
<tr>
<th>Metric</th>
<th>HPHS 2009</th>
<th>AHLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion of Matriculation process</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td>Unit completion (HPHS 2009 after 6 semesters, AHLC as of fall 2012)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 12 units</td>
<td>46%</td>
<td>7%</td>
</tr>
<tr>
<td>13 - 24 units</td>
<td>21%</td>
<td>93%</td>
</tr>
<tr>
<td>25 - 36 units</td>
<td>19%</td>
<td>--</td>
</tr>
<tr>
<td>&gt;36 units</td>
<td>12%</td>
<td>--</td>
</tr>
</tbody>
</table>
2 YEAR PROGRAM WITH GUARANTEED

Enrollment in the course sections students need to complete Prerequisites for SCC Allied Health programs of:

Occupational Therapy Assistant
Physical Therapist Assistant
Registered Nursing
Dental Hygiene
Vocational Nursing
IF PROGRAM FOLLOWED FOR 2 YEARS

AS degree in Biology

Most of units taken within the two years are transferable to 4 year programs of Allied Health.
ELIGIBILITY FOR PROGRAM:

Interested in Health Care Career!

High School GPA 2.0 or better

Completed Algebra 2 with "C" or better

Completed English 12 with "C" or better

Los Rios Assessments of:

Math 100 or higher

EngWr 101 or higher

EngRd 310 or higher
<table>
<thead>
<tr>
<th></th>
<th>Summer 2012</th>
<th>Fall 2012</th>
<th>Spring 2013</th>
<th>Summer 2013</th>
<th>Fall 2013</th>
<th>Spring 2014</th>
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</thead>
<tbody>
<tr>
<td><strong>AH 110 Med Term</strong></td>
<td>BIO 100 Intro to Bio</td>
<td>BIO 430 A&amp;P</td>
<td>BIOL Review Workshop</td>
<td>BIO 431 A&amp;P</td>
<td>BIO 440 Microbiology</td>
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</tr>
<tr>
<td><strong>WKSHPS Math/Writing</strong></td>
<td>Chem 309 5</td>
<td>FCS 324 3</td>
<td>Psych 300 3</td>
<td>ENGWr 300 3</td>
<td>COMM 301 Public Speaking</td>
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<tr>
<td><strong>WKSHPS BIO Lab</strong></td>
<td>Math 123 3</td>
<td>Math 124 3</td>
<td>Phil 310 Intro to Ethics</td>
<td>***VA/Vi Hist 310, 311, 320 321, 370, 371</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EngRd 312 3</td>
<td>BIO 290 1</td>
<td>Study Hall</td>
<td>PE 1 1</td>
<td>BIO 342 New Plagues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soc 300 3</td>
<td>NUTR 300 3</td>
<td></td>
<td></td>
<td>(RT) Majors only: Phys 310 &amp; AH 120 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCD 330 1</td>
<td>HCD 310 College Success</td>
<td></td>
<td></td>
<td>Optional: 1.5 PTA 100 or DH 100 0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional: 1</td>
<td>OTA 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Able to Apply for: DA &amp; EMT</td>
<td>Apply for: OTA, VN</td>
<td></td>
<td>Apply for: PTA</td>
<td>Apply for: RN &amp; DH &amp; RT &amp; DMS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Embedded Counselor in AHLC

- Provides the student services perspective
- External and internal alignment of counseling
- EQ is a key indicator for success (On Course™)
- Case management provides continuity of support services
- “Proactive counseling”, study and time management strategies, conducts “study hall”
What we learned from Cohort #1

• Our students are very hard working
• Our students used “magical thinking” hoping they might pass with a low “D” grade
• Early in college students are slow to take advantage of non-mandatory tutoring
• Handling 2 science courses early in their college experience proved difficult
What we are changing for cohort 2

• Chemistry will be linked with Algebra so students can get help with the mathematical problem solving in Chemistry
• Greater emphasis on Community building during summer and fall semesters
• Some courses offered in Fall will be 8 week instead of 16 weeks to help students with managing fewer courses at one time
Eliminating Assessment & Placement Barriers

PAUL DE GENNARO M.S.  
(AND SOON TO BE PHD!!!)

PROFESSOR OF ANATOMY AND PHYSIOLOGY  
AT SACRAMENTO CITY COLLEGE
Tim Tebow: College Football Legend

- BCS National Championship Game Winner
- Heisman Trophy Winner
Tim Tebow: NFL Unsigned Free Agent
Kurt Warner: University of Northern Iowa
Kurt Warner: From Undrafted to NFL Super Bowl MVP
Why the Difference in Outcomes?
Achievement vs. Aptitude
Focus on Achievement in K-12

HOW HAS IT BEEN WORKING FOR US?
# U.S. STEM Performance (PISA, 2009)

<table>
<thead>
<tr>
<th>#</th>
<th>Country</th>
<th>Maths</th>
<th>Sciences</th>
<th>Reading</th>
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<tbody>
<tr>
<td>1.</td>
<td>Shanghai, China</td>
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<tr>
<td>2.</td>
<td>Singapore</td>
<td>562</td>
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<td>3.</td>
<td>Hong Kong, China</td>
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<tr>
<td>4.</td>
<td>South Korea</td>
<td>546</td>
<td>542</td>
<td>533</td>
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<tr>
<td>5.</td>
<td>Taiwan</td>
<td>543</td>
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<tr>
<td>6.</td>
<td>Finland</td>
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<td>7.</td>
<td>Liechtenstein</td>
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<td>8.</td>
<td>Switzerland</td>
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<td>9.</td>
<td>Japan</td>
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<td>10.</td>
<td>Canada</td>
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<td>508</td>
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<td>11.</td>
<td>Netherlands</td>
<td>526</td>
<td>522</td>
<td>506</td>
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<tr>
<td>12.</td>
<td>Macau, China</td>
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<tr>
<td>13.</td>
<td>New Zealand</td>
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<td>14.</td>
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<td>17.</td>
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<td>Denmark</td>
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<td>Austria</td>
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<td>25.</td>
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<tr>
<td>27.</td>
<td>Czech Republic</td>
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<tr>
<td>28.</td>
<td>United Kingdom</td>
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<td>499</td>
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<tr>
<td>29.</td>
<td>Hungary</td>
<td>490</td>
<td>496</td>
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<tr>
<td>30.</td>
<td>United States</td>
<td>487</td>
<td>494</td>
<td>484</td>
</tr>
</tbody>
</table>
Time for Change in STEM Education Practices

THROUGH BETTER ASSESSMENT, IDENTIFICATION, REMEDIATION, AND INSTRUCTION PRACTICES
STEM Aptitudes: Computation vs. Conceptualization

Spatial Ability

[Images showing spatial reasoning tasks]

Proportional Reasoning

[Images showing proportional reasoning tasks]

Pitch Pattern Perception

[Images showing music notation]

AHLC Student Assessment Outcomes

General Cognitive Ability
CTOPP
Placement Scores
STEM-Score Composite
Findings and Outcomes

- ½ of top scoring STEM-Score performers, were below average on SCC’s placement assessments.

- Significant correlations to all 5 STEM courses taken.
  - Regression findings of 20% to 60% explanation of variance.

- Only 1 student beyond the top 1/3 STEM-Score performers made it beyond the CHEM 309 course in the Fall of 2012.
  - Almost all of the highest scorers did pass.
AHLC Student Course Outcomes

“High” Scoring Group

“Low” Scoring Group
Can These Skills Be Improved?

If yes, will these improvements impact course performance?
Interventions: Skills and Curricular

Skill Development

“Curricular Intervention”
Intervention Outcomes

- Significant improvement in skills (now similar to non-AHLC controls).

- Big Impact on Retention Rates.

- Significant Difference in Grade Outcomes for BIO 100 and CHEM 309.
Implications

- Consideration of use as a “Multiple Measure”, and for Science course placement.

- Remediation is possible, and is simple to institute.

- Curricular modifications and support for students can occur based on template I’ve developed.
Future Directions

- Link K-12 to post-secondary through common language and practices.
- Broaden Scope to include all of STEM.
A Flip with a Twist

Chemistry 309
Integrated General, Organic & Biochemistry

Dianne A. Bennett, Ph.D.
Atoms to Pathways

[Chemical diagram showing the conversion of fatty acyl-CoA to acetyl-CoA through a series of enzymatic steps.]
Course content spans 2 ½ years of college chemistry in 16 weeks.
The Many Facets of Chem 309

Lab: experiments and workshops to reinforce understanding of important course concepts

Homework: post-activity exercises, text, online, and supplemental

Assessment: weekly quizzes, molecular portfolio, 3 exams, 1 cumulative final
## Student Success in Chem 309
### Traditional Format

<table>
<thead>
<tr>
<th>student group</th>
<th>student retention*</th>
<th>student success*</th>
</tr>
</thead>
<tbody>
<tr>
<td>open access</td>
<td>90%</td>
<td>60%</td>
</tr>
<tr>
<td>AHLC</td>
<td>80%</td>
<td>20%</td>
</tr>
</tbody>
</table>

* Small data sets limit the precision. % calculated from census date enrollment.
9 AHLC students re-enroll to repeat Chem 309 the following spring.

"Insanity:
doing the same thing
over and over again
and expecting
different results."

Albert Einstein
Cognitive Domains & The Flipped Format

- Evaluation
- Synthesis
- Analysis
- Application
- Comprehension
- Knowledge

Higher Level Thinking
The Flipped Format

- Pre-assigned video tutorials
- Guided Inquiry Group Work
- i-clicker wrap up
- Group Daily Report, Activity Report & Assignment Log
## Experiment in Progress*

<table>
<thead>
<tr>
<th>student group</th>
<th>student retention**</th>
<th>student success**</th>
</tr>
</thead>
<tbody>
<tr>
<td>open access (traditional)</td>
<td>90%</td>
<td>60%</td>
</tr>
<tr>
<td>open access** (flipped)</td>
<td>80%</td>
<td>60%</td>
</tr>
<tr>
<td>AHLC (traditional)</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>AHLC** (flipped)</td>
<td>90%</td>
<td>70%</td>
</tr>
</tbody>
</table>

* Small data sets limit the precision.

** % calculated from census date enrollment.

*** Student retention/success predicted from “point totals to date.”
Reflection & Concluding Remarks

- Preliminary data indicates that the “flipped” format supports vulnerable student populations. (AHLC 18 – 20 year olds)

- Students expressed positive support for the “flipped” format in a survey. (>90%)

- Improved student success among students completing course. (90% vs 70%)
\[ \int \frac{k}{(k+i\mu)(k-i\mu)} e^{ikr} dk = \pi i e^{rac{k^2}{2i\mu}} \]
\[ \int_{-\infty}^{\infty} \frac{k}{(k+i\mu)(k-i\mu)} e^{ikr} dk = \frac{2\pi i}{\mu} e^{rac{k^2}{2i\mu}} \]
\[ (k-i\mu) e^{ikr} dk + \int_0^{\infty} \frac{k}{(k+i\mu)(k-i\mu)} e^{ikr} dk = \frac{2\pi i}{\mu} e^{rac{k^2}{2i\mu}} \]

The word **science** is superimposed on the left side, and **art** is on the right side. The text is a mathematical expression involving integrals and exponentials, possibly related to quantum mechanics or a similar field.
Buy Little Sun at regular price in areas of the world with electricity and help make it available in off-grid communities at much lower prices.
STEM - Obama took up cause in 2010
art leaders are calling for the addition of the list of essential subject
STEAM. (Science, Technology, Engineering, Art, Math)

Genspace in Brooklyn

MIT’s center for Art, Science and technology

Art/Sci Center + Lab, UCLA

OpenLab - Santa Cruz

Global Alliance for Arts & Health (Facebook page)

Art Center College of Design in Pasadena, CA
How does Art fit into the Allied Health Learning Community?
Brain Plasticity
EXPERIENCE = USABILITY/ANALYTIC + DESIGN/CREATIVE

Left-Brain Functions
- Analytic thought
- Logic
- Language
- Science and math

Right-Brain Functions
- Holistic thought
- Intuition
- Creativity
- Art and music
The New
Drawing on the Right Side of the Brain

A course in enhancing creativity and artistic confidence

Betty Edwards
Challenges
Changes

1. Change name of class
2. Location, change day and time
3. Syllabus, create evaluation system
4. Continue linked learning with other subjects
Suggested integration of art in AHLC

Phase 1 - Learning Perception through drawing

Phase 2 - Integrating art therapy activities for student's future occupation

Phase 3 - Creating art
sources:

http://www.olafureliasson.net/
www.littlesun.com

Why our Schools Need the Arts by Jessica Hoffmann Davis

THE BRAIN THAT CHANGES ITSELF: Stories of Personal Triumph from the Frontiers of Brain Science by Norman Doidge, M.D. 2007

Drawing on the Right Side of the Brain by Betty Edwards 2012

Where Science and Art Collide. ArtNews March 2013

Global Alliance for Arts & Health (facebook page)

Genspace in Brooklyn
MIT’s center for Art, Science and technology
Art/Sci Center + Lab, UCLA
OpenLab - Santa Cruz
Art center College of Design in Pasadena, CA

My website: www.iannanovafrisby.com