Making STEM SESI Again!

Sacramento City College’s SESI Program
What is SESI?

- 5 year, high touch program funded by the DOE, designed to address the lack of success in STEM pathways of our Latino/a or low income students: the SESI student cohort grows by 30 students every year. Currently beginning Y2 cohort (60 students)
  - Outreach/recruitment
  - Near-peer mentors
  - Dedicated counseling
  - Focused pathways, acceleration to college-level courses
  - STEM enrichment activities at SCC: guest speakers and field trips
  - In class tutoring and in-place remediation of skills
  - Faculty advising, formation of a faculty professional learning community: the SESI PLC
  - Job placement and transfer assistance
Action Plan

Goals:

- Growth of SESI program by 30 students per year
- Improved communication with student cohorts about what is required for the SESI program specifically and college success generally
- Integration of college support services into the SESI program
- Retention of at least 75% of SESI students to Y2 and Y3
- Certificates, AA degrees and/or transfer of at least 75% of SESI students in Y3, Y4, Y5
SESI Cohort 2 (Fall 2018)
STEM Equity and Success Initiative (SESI)

SCC's SESI Program
“Long Introductions”

- Long Introductions- tell our story. Our stories capture breakthroughs, trials and tribulations, educational journeys, and family narratives.

- *In the words of Dr. Louie Rodriguez “Our stories are the curriculum, getting others to tell their story is pedagogy, and learning from one another is transformation”

- As demonstrated by two of our First Cohort Sesi students:
  - David Ortega
  - Jorge Gonzalez
David Ortega
Jorge Gonzalez
Martin Ramirez
“Resilient” SESI Students’ Interviews

- SESI students felt a strong sense of community.
- Many of the students indicated that succeeding in classes was entirely up to the work students were willing put in, since SESI offered all the help necessary to succeed.
- Most students identified struggles with “personal issues” as an obstacle to their academic success.
- Students reported needing clearer expectations re: time and effort commitments.
ENGWR Outcomes

**SESİ Placement for ENGWR**

- Accelerated: 32%
- Tested In: 68%

**Completion of Transfer Level English in Year 1**

- Statewide
- SCC
- SESİ

African American & Hispanic Students Combined

- 0%
- 20%
- 40%
- 60%
- 80%
Math Outcomes

- College-Level Math (Math 120) *Fall 2017
  - 58% success rate (typically 40-45% without acceleration)
  - 94% persistence rate
- Transfer-Level Math (Math 335) *Spring 2018
  - Only 13% successfully completed (normally 6% in the first year, for Hispanic students specifically at SCC)
  - 29% of those that took the course successfully completed it.
All Remaining Classes Fall 2017

- ENGWR 108 (65% pass rate, 97% persistence)
- “STEM INTRO” (97% pass rate, 100% persistence)
- LIBR 318 (87% pass rate, 100% persistence)
- HCD 310 (100% pass rate, 100% persistence)

STEM-Score Assessments were significantly correlated with both Math and English outcomes ($r = .6$ to $.67$ respectively!)
Spring 2018

Average GPA for Spring 2018:

1.43

Correlation with STEM-Score Assessment:

\[ r = .77 \]
Matriculation Processes

- STEM-Score ™ Assessment
- Adolescent/Adult Sensory Profile
- Student Needs Questionnaire
Achievement vs. Aptitude
“Achievement” Outcomes
Skill Development for Long-Term Performance
Why the Difference in Outcomes? Achievement misused as measure of preparedness.
STEM Aptitudes:
Computation vs. Conceptualization

Spatial Ability

Proportional

Pitch Pattern Perception
STEM-Score™ Demonstration

Let’s give it a try!
1) Please go to stem-score.com
2) Click on the button in the left, lower corner “STUDENT MEASURE”
3) Enter the code when prompted
What Does Curriculum Look Like?

- INDIS 370 (Intro to STEM)
- INDIS 371 (Skills Practice in STEM)
- INDIS 372 (Numerical Problem Solving in STEM)
- INDIS 373 (Research Writing in STEM)
Professional Learning Community

SESI PLC Website
The PLC

- The SESI Professional Learning Community:
  - Meets twice monthly (second and fourth Fridays, 3-5 pm, Lillard 115)
  - Meetings focus on cross discipline discussions centered on three topics:
    - Equity in the classroom
    - Active learning principles and techniques we can use in our classrooms
    - Learning communities and their role in higher education
  - The meetings also focus on problem solving for our students in real time.
SESi PLC ‘BEST PRACTICES’ WHICH WE AGREED TO ADOPT IN OUR CLASSES FOR 2018-2019

- Mandatory use of binders for courses to organize course content: official ‘Organized Binders’ or other.
- Mandatory student signup for tutoring assistance: this was not further defined, but could be use of the Math Lab, the Writing Center, the Science Tutoring Center, or individual signup with an appropriate LRC tutor.
- Mandatory office hours visit(s): we all commit to making office hours visits compulsory rather than optional.
- Use of “Long Introductions” to help us recognize the ‘cultural capital’ that our students bring to their college careers.
Sample Student Profile

Evan de Gennaro
Cohort: Lost in Space?

Adolescent/Adult Sensory Profile Results

<table>
<thead>
<tr>
<th>Low Registration</th>
<th>Sensory Sensitivity</th>
<th>Sensation Seeking</th>
<th>Sensation Avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(38/75) More than most people</td>
<td>(59/75) More than most people</td>
<td>(36/75) Similar to most people</td>
<td>(38/75) Similar to most people</td>
</tr>
</tbody>
</table>

STEM-Score Results

<table>
<thead>
<tr>
<th>Problem Solving</th>
<th>Rotating Shapes</th>
<th>Musical Samples</th>
<th>STEM-Score Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready for More</td>
<td>Ready for More</td>
<td>Well Prepared</td>
<td>109</td>
</tr>
</tbody>
</table>
## Table 5.1
### Intervention Strategies for High Scores in Low Registration

<table>
<thead>
<tr>
<th>Taste/Smell</th>
<th>Movement</th>
<th>Visual</th>
<th>Touch</th>
<th>Activity Level</th>
<th>Auditory</th>
</tr>
</thead>
<tbody>
<tr>
<td>To make meals more interesting, incorporate unfamiliar foods, unusual combinations, or foods with intense tastes or smells</td>
<td>Use larger, more forceful movements before refining patterns</td>
<td>Make visual cues more salient—underline, bold, highlight, use color</td>
<td>Use visual cues to notice when things are touching you</td>
<td>Go into a meeting prepared with questions, agenda, etc.</td>
<td>Ask others to slow down, speak up, or repeat as needed</td>
</tr>
<tr>
<td>Use extra care when drinking hot liquids</td>
<td>Use weights or other forms of resistance</td>
<td>Label drawers, cabinets</td>
<td>Ask others to let you know if you are getting too close</td>
<td>Ask people to summarize/restate the most important points</td>
<td>Tape record important information</td>
</tr>
<tr>
<td>Make sure smoke detectors are present and working</td>
<td>Use visual cues (watch where you are going) to support movement activities</td>
<td>Take notes so that information can be reviewed and processed later</td>
<td>Set water heaters at a lower temperature to prevent burns</td>
<td>Use lists, reminders, date books, calendars, etc., as cues</td>
<td>Ask for verbal information to be in written form</td>
</tr>
<tr>
<td></td>
<td>Use/add stair rails, bars, and other cues to mark steps, doorways, etc.</td>
<td>Use mirrors to check personal appearance</td>
<td>Pay attention to weather reports and temperature to determine appropriate dress</td>
<td>Shop in stores with clearly marked areas or helpful workers</td>
<td>Ask for lots of examples</td>
</tr>
<tr>
<td></td>
<td>Put anti-slip bathmats in the tub/shower</td>
<td>Place important objects (keys, bills to be paid) in an obvious location</td>
<td>Add texture to objects to help with detection (e.g., use puffy paint on appliance knobs to know when on/off)</td>
<td>Talk yourself through a task to make sure you processed what was said</td>
<td>Explain or repeat information back to the speaker to make sure you processed what was said</td>
</tr>
<tr>
<td></td>
<td>Wear non-slip shoe soles</td>
<td>Change colors, fonts, placement of objects, to decrease familiarity/habituation</td>
<td></td>
<td>Write something down or talk it through to another person before executing a task</td>
<td>Use an alarm on your watch for reminders</td>
</tr>
<tr>
<td>Taste/Smell</td>
<td>Movement</td>
<td>Visual</td>
<td>Touch</td>
<td>Activity Level</td>
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<tr>
<td>Find scented</td>
<td>Use rocking chairs for calming effects</td>
<td>Use systematic methods of visual</td>
<td>Use deep-pressure touch rather than</td>
<td>Incorporate breaks and time-outs</td>
<td>Limit the amount of information/</td>
</tr>
<tr>
<td>products that you</td>
<td>Limit the amount of steps when learning a</td>
<td>scanning (left to right, top to</td>
<td>light touch</td>
<td>Look for smaller, less crowded,</td>
<td>steps that are provided at any one</td>
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<tr>
<td>like and use them</td>
<td>new movement activity</td>
<td>bottom)</td>
<td></td>
<td>more organized stores in which to</td>
<td>time</td>
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<td>regularly</td>
<td>Select movement activities that allow you to</td>
<td>Organize drawers, closets, etc., so</td>
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<td>do your shopping</td>
<td>Reduce the volume or amount of</td>
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<td></td>
<td>keep your head upright and/or maintain a</td>
<td>that it is easy to pick out what you</td>
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<td>auditory stimuli</td>
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<td>consistent speed (e.g., bike riding</td>
<td>are looking for</td>
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<td>Provide handouts to supplement</td>
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<td>instead of aerobic exercising)</td>
<td>Eliminate background visual</td>
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<td>verbal information</td>
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<td>stimuli—place objects so that they</td>
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<td>In group settings, participate in</td>
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<td>are in one layer</td>
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<td>the discussion, answer questions to</td>
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<td>help maintain focus</td>
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<td>Ask another person to give you</td>
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<td>cues when it looks as if you are</td>
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<td>mentally drifting or losing focus</td>
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<td>Identify flavors</td>
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<td>and ingredients that</td>
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<td>you prefer, and find</td>
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<td>ways to incorporate</td>
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<td>them into daily</td>
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<td>meals</td>
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<td>Introduce new foods</td>
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<td>and smells</td>
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<td>gradually</td>
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Rotating Shapes (Ready for More)

Skill Development:
Construction, Drawing, Navigation, etc.

Recommendations for the Classroom:
- Must be an emphasis on spatial language (shapes, sizes, orientation, etc.), but, you want to be as specific as possible (actual measurements)
- Qualitative drawings (bigger, smaller, wider, etc.), and then include as much texture, realistic looking detail as possible
- Take time to physically demonstrate/act out functions (water boiling, etc.) by drawing up a script and helping others understand what’s happening
- Having a frame of reference (steps to help measure/estimate distances for instance), and don’t be afraid to be really specific with things other than distance or weight (like density, volume, etc.)
- Taking pictures or video recording of class topics (experiments, etc.), then talking about it later that day
PLC Continued

- Step-Back Consultation Demonstration
Administration/Management
Final Questions

- Navigating the Campus Landscape
  - Curriculum development (Paul)
  - Data collection (Paul)
  - FTE’s, ESA’s, etc. (Martin)
  - Scheduling issues (Martin)
  - Scaling (Martin and Paul)