Math Jam!
Building Community and Improving Math Placement at Cañada College.

CMC³ Fall Conference December 14th, 2013

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Denise Hum
Ray Lapuz
Danni Redding-Lapuz
Chris Woo
Brandon Price
Introductions

• Schools represented?

• Are you ...
  – Implementing a “Math Jam” / bridge program?
  – Planning to implement?
  – Thinking about initiating?

• What would you like to learn in this session?
An Opener

• Rock-Paper-Scissors Tournament
  – The loser cheers for the winner in the next game(s)
  – The winner inherits all of the loser’s cheerleaders.
  – Play until there’s one winner in the room.

• Math Question:
  – How many games were played?
Outline

• Background
  – Who we are
  – The Problem

• Math Jam!
  – Goals
  – Structure
  – Impact on Student Success
  – Impact on STEM community

• On starting your own Math Jam.
CONTEXT

• Cañada College
• Redwood City

Climate Best by Government Test
About Cañada College

- One of 112 California community colleges
- Federally designated Hispanic-Serving Institution
- One of the smallest in the San Francisco Bay Area

Student Ethnicity - Fall 2012:

- African American: 4%
- American Indian: 0%
- Asian: 7%
- Filipino: 3%
- Hispanic: 45%
- Pacific Islander: 5%
- Two or More Races: 3%
- Unknown: 2%
- White: 31%
A gap between goals and success.

**Declared majors in Engineering**
- Hispanic: 46%
- Caucasian American: 28%
- Asian American: 4%
- African American: 4%
- Others: 18%

**Transferred as Engineering Major**
- Others: 28%
- Hispanic: 19%
- Caucasian American: 31%
- Asian American: 21%
- African American: 1%
Over 70% of Cañada College Minority STEM Students place into Pre-algebra or Algebra

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Pre-algebra</th>
<th>Algebra</th>
<th>College Algebra</th>
<th>Trig or Higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td><strong>71.9%</strong></td>
<td><strong>15.6%</strong></td>
<td>6.3%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Asian American</td>
<td>20.8%</td>
<td>22.9%</td>
<td>33.3%</td>
<td>22.9%</td>
</tr>
<tr>
<td>Caucasian American</td>
<td>22.9%</td>
<td>31.4%</td>
<td>24.8%</td>
<td>21.0%</td>
</tr>
<tr>
<td>Mexican American</td>
<td><strong>39.1%</strong></td>
<td><strong>26.2%</strong></td>
<td>22.1%</td>
<td>12.5%</td>
</tr>
<tr>
<td>All Students</td>
<td>32.9%</td>
<td>26.7%</td>
<td>23.8%</td>
<td>16.6%</td>
</tr>
</tbody>
</table>
Math Jam: FREE! (for students)

• One-week intensive math preparation program
• Developed through a Dept. of Ed grant, then institutionalized (Minority Science and Engineering Improvement Program).

• Goals:
  – Help students progress faster through math sequence:
    • Placing higher on college math placement test
    • Improving preparedness and increasing course success rates.
  – Improve student awareness of STEM majors and resources.
  – Increase student knowledge of college success skills.
  – Develop a community of learners among program participants.
Math Jam Elements

• Math Placement Test Preparation
  • Pre-algebra, Algebra, College Algebra, Trig, Precalc, Calculus

• Group Lessons and Individual Tutoring

• Access to Counseling

• Workshops
  • Problem-solving
  • Math Anxiety
  • Time management
  • Test taking strategies
  • STEM career panel

• Coffee, snacks and LUNCH!
Math!

• Used My Math Test
  – Online system by Pearson (similar to MyMathLab)
  – Customizes individual study plan
  – Free from publisher – good for 12 weeks
  – Topics aligned w/course SLOs at each level

• 5-6 Instructors (Pre-algebra, Elementary Algebra, College Algebra, Trigonometry and higher, Stats, Now Calculus)
  – Setup My Math Test problem/topic sequence
  – Monitor Student Progress
  – Plan mini-lessons
  – Manage tutors

• About 1 tutor for every 4-8 students (fewer students per tutor for lower levels).
Math Jam Process

- Students Grouped according to Placement or Next Class
- MyMathTest Pretest builds individual Study Plan
- Lessons, Mini-Lectures, Workshops
- Practice with Study Plan, Quizzes, Tutoring
- Retake Placement & MMT Postest (Now on Sat. Morning)
Topic-Lesson Cycle

Mini-Lesson by instructor or tutor

Worksheet in groups / at boards with tutors

More practice if needed: Study Plan, watch videos, individual tutoring.

Retake Assessment if time allows

MyMathTest Topic Assessments
Improved Test Scores

Placed into Higher Level

<table>
<thead>
<tr>
<th>Year</th>
<th>Improved Test Scores</th>
<th>Placed into Higher Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>94%</td>
<td>64%</td>
</tr>
<tr>
<td>2010</td>
<td>91%</td>
<td>71%</td>
</tr>
<tr>
<td>2011</td>
<td>96%</td>
<td>52%</td>
</tr>
<tr>
<td>2012</td>
<td>95%</td>
<td>61%</td>
</tr>
</tbody>
</table>
Growth

Math Jam Participants

<table>
<thead>
<tr>
<th>Year</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>50</td>
</tr>
<tr>
<td>2010</td>
<td>290</td>
</tr>
<tr>
<td>2011</td>
<td>331</td>
</tr>
<tr>
<td>2012</td>
<td>482</td>
</tr>
</tbody>
</table>
Persistence of Cañada College Students

- Average Persistence Rates of All First Time Students
- First Time Students who attended 2011 Math Jam

Persistence - First Time Students
(Fall 2011)

<table>
<thead>
<tr>
<th></th>
<th>Fall 11</th>
<th>Spring 12</th>
<th>Fall 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>MJ Participants</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>Not MJ Participants</td>
<td>60%</td>
<td>40%</td>
<td>40%</td>
</tr>
</tbody>
</table>
How do Math Jam participants perform in subsequent Math Course?

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Retention</th>
<th>Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 Math Jam participant</td>
<td>56</td>
<td>93%</td>
<td>77%</td>
</tr>
<tr>
<td>performance in Fall 2011 Math course.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Cañada students</td>
<td>1692</td>
<td>77%</td>
<td>53%</td>
</tr>
<tr>
<td>performance in Fall 2011 Math course.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1748</td>
<td>$p=.005$</td>
<td>$p&lt;.001$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Difference is statistically significant at .05 level)</td>
<td>(Difference is statistically significant at .05 level)</td>
</tr>
</tbody>
</table>
How do Hispanic Math Jam participants perform in subsequent math course?

<table>
<thead>
<tr>
<th></th>
<th>$n$</th>
<th>Retention</th>
<th>Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 Math Jam Hispanic participant performance in Fall 2011 Math course.</td>
<td>31</td>
<td>94%</td>
<td>74%</td>
</tr>
<tr>
<td>All Hispanic students performance in Fall 2011 Math course.</td>
<td>629</td>
<td>75%</td>
<td>47%</td>
</tr>
<tr>
<td></td>
<td>660</td>
<td>$p=.017$</td>
<td>$p=.003$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Difference is statistically significant at .05 level)</td>
<td>(Difference is statistically significant at .05 level)</td>
</tr>
</tbody>
</table>
How do “jumpers” perform in their subsequent course?

<table>
<thead>
<tr>
<th></th>
<th>$n$</th>
<th>Retention</th>
<th>Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 Math Jam “Jumpers”</td>
<td>20</td>
<td>90.47% (19/21)</td>
<td>71.42% (15/21)</td>
</tr>
<tr>
<td>All students in Math</td>
<td>1692</td>
<td>77%</td>
<td>53%</td>
</tr>
<tr>
<td>courses</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Impacts of Math Jam

- Students emphasize that Math Jam had a significant impact on their comfort at Cañada – they feel supported by other students, tutors and faculty.
- Students become integrated into the campus community and are more likely to utilize resources and engage in activities.
- Increased social capital and engagement directly impact retention and persistence rates.
- Program builds cohesiveness between STEM faculty and program staff.

“I learned more in four days at the Math Jam than I did in three semesters at high school.”

“If it weren’t for Math Jam, I’d be failing Calculus II right now. I have an A.”
Casual but Focused

• Supportive Environment.
  • Support from professors and tutors.
  • Promotes self confidence in math.
  • Confidence is demonstrated through future classes.
• STEM recruitment works.
  • Makes STEM info available to students and opens up opportunities.
• Recruits and trains tutors.
  • Math Jam participants often come back as Math Jam tutors in the future.
• Strong community and identification with STEM CENTER
Evolution of Math Jam

2008
Cañada College, awarded a Minority Science and Engineering Improvement Program Grant (MSEIP-SOLES)

2009
MSEIP-SOLES Grant funds two-week Summer Math Jam
50 students participate

2010
Math Jam a success
Popularity increases
100+ participants
Add one-week Mini Math Jam
Math Jam participation exceeds 300 students annually. Persistence, retention, success results - all positive.

2011

HSI-STEM CalSTEP Grant received
Evening Math Jam is born

2012

Physic-Jam and Word Jam Spawned

2011

Math Jam institutionalized!!
Funded by local bond issue and Basic Skills
Math Jam wins!!
- Example of Excelencia,
- J. Russell Kent
- ASCC Exemplary Program Awards

Calculus and Above group added
(20+ participate)
January 7-11, 2013

Daytime: 9:00 am - 3:00 pm
Evening: 6:00 pm - 9:00 pm

canadacollege.edu/STEMcenter/MathJam
apply by December 28, 2012
Mini Math Jam
January 9-13, 2012

6:00 P.M. – 9:00 P.M.
NIGHT
You choose.

6:00 P.M. – 9:00 P.M.
DAY

Applications Due:
December 2, 2011
canadacollege.edu/BRIDGE
JAM on it.

**Math Jam**
June 4-14, 2012 (M-TH)
Daytime: 9:00 am - 3:00 pm
Evening: 6:00 pm - 9:00 pm

**Physics Jam**
July 9 - August 3, 2012 (M-TH)
9:00 am - 3:00 pm

**Mini-Math Jam**
August 13-17, 2012 (M-F)
Daytime: 9:00 am - 3:00 pm
Evening: 6:00 pm - 9:00 pm

Apply ONLINE by May 18, 2012
canadacollege.edu/MathJam
Mini PHYSICS JAM

Review mathematical concepts needed to succeed in Physics and more (recommended for incoming Physics 250 & 260 students).

January 7-11, 2013
9:00 am - 3:00 pm

canadacollege.edu/STEMcenter/PhysicsJam

apply online by December 28, 2012
Fast Track to CALCULUS

Math 130 Analytical Trigonometry (CRN 43196) 4 units
Math 222 Pre-Calculus (CRN 43558) 5 units

You can complete both trigonometry and pre-calculus in just one semester. Get access to additional support and tutoring to help you focus on learning math. Students enroll in Math 130 AG now and we will enroll you in Math 222A/B when classes begin. For more information, please contact Denise Hum at humd@smccd.edu.
Trophy Room

• **National: Excelencia Award**

• State Academic Senate: Exemplary Program Award

• Local: J. Russell Kent Award
Like us on Facebook!
Grow your own Math Jam...

• Branding is important.
• Institutionalize:
  – Work closely with existing programs especially the tutoring center.
• Pay Teachers and Tutors!
• Ask us any questions
• Visit Math Jam!
• [Math Jam Toolkit](#) Available
  [hoffmanm@smccd.edu](mailto:hoffmanm@smccd.edu)
Questions to Start

1. What do you see as the elements of a successful program your institution?

2. Who are the people in the various areas who would be able to make it happen?
   – Instructors
   – Learning Support Staff
   – Tutors
   – Administrative Support

3. What are some possible funding sources?
   (Grants? Basic Skills? ...)
Math Jam Toolkit

• Detailed description and advice on:
  – Funding ideas
  – Outreach and Registration
  – Staffing, Supplies, Timeline etc.
  – Curriculum
  – Evaluation

• Sample Documents:
  – Student Contracts
  – Registration forms
  – Curriculum ideas
  – Checklists

• Email:
Acknowledgements

- STEM Center Team:
  - Janet Stringer, Dean
  - Amelito Enriquez, Ph.D.
  - Danni Redding Lapuz
  - Ana Camacho
  - Chris Burwell Woo
  - Brandon Price
- MESA and Cathy Lipe
- Math Jam Instructors
  - Denise Hum
  - Ray Lapuz
  - Hongyan Meng
  - Danielle Ta
  - Yvette Butterworth
  - Judy Choy
  - Parvaneh Darafshi
  - Jonathan MacSwain
  - Christina Arenas
- Math Jam Tutors!!
Thank You!

Michael Hoffman

hoffmanm@smccd.edu
Student Completion Rate*

Completion Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Completion Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>84%</td>
</tr>
<tr>
<td>2010</td>
<td>86%</td>
</tr>
<tr>
<td>2011</td>
<td>85%</td>
</tr>
<tr>
<td>2012</td>
<td>83%</td>
</tr>
</tbody>
</table>

*Completion means student took the posttest and the post-program survey.
## 2010 Math Jam Attitudes

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-Program</th>
<th>Post-Program</th>
<th>Difference (Post - Pre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you rate your math study skills? 1=poor, 5=excellent</td>
<td>3.06</td>
<td>3.64</td>
<td>0.57***</td>
</tr>
<tr>
<td>How would you rate your confidence in math? 1=not at all confident, 5=very confident</td>
<td>3.16</td>
<td>3.62</td>
<td>0.46**</td>
</tr>
<tr>
<td>How effective are you at time management? 1=not at all effective, 5=very effective</td>
<td>3.70</td>
<td>3.81</td>
<td>0.11</td>
</tr>
<tr>
<td>To what extent do you have supportive relationships with students at Cañada? 1=not at all supportive, 5=very supportive</td>
<td>3.77</td>
<td>4.13</td>
<td>0.36*</td>
</tr>
<tr>
<td>To what extent do you have supportive relationships with tutors at Cañada? 1=not at all supportive, 5=very supportive</td>
<td>3.66</td>
<td>4.38</td>
<td>0.72***</td>
</tr>
<tr>
<td>How interested are you in studying STEM? 1=not at all interested, 5=very interested</td>
<td>3.78</td>
<td>3.83</td>
<td>0.05</td>
</tr>
</tbody>
</table>