Creating Accelerated Educational Pathways for Underprepared STEM Students through an Intensive Math Placement Test Review Program

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Abstract

A majority of California community college students enter college with low levels of preparation for college-level work, especially in math. For students interested in pursuing science or engineering degrees, this may mean up to four or five years of coursework before they are eligible to apply for transfer to a four-year institution. As a result, many of them drop out or change majors even before taking transfer-level STEM courses. To facilitate the entry of these underprepared students, Cañada College, a federally designated Hispanic-serving community college in the San Francisco Bay Area, developed the Summer Math Jam, which is a two-week intensive math placement test review program. Implementation of the program over the last four years shows success in improving student performance in the math placement test, in preparing students for success, and in creating a sense of community among program participants. An analysis of student academic performance in subsequent semesters shows significantly higher success and retention rates among Math Jam participants compared to nonparticipants. The success of Math Jam has led to the development of the Mini-Math Jam – a shorter, one-week version of Math Jam that is offered a week prior to the beginning of the fall semester, and during the winter break. Since the initial implementation of Math Jam in summer 2009 the program has served over 1000 students, and enrollments in transfer-level STEM courses have increased significantly, with a higher rate of increase among minority students.

This paper describes the evolution of Cañada College's Math Jam Program, including challenges encountered and the strategies employed to overcome those challenges. The paper will also provide resources that have been developed at Cañada to assist other institutions in developing a similar program to improve the participation and success of underprepared students in STEM.

1. Introduction

A recent report prepared by the President's Council of Advisors on Science and Technology (PCAST) report, "Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics," indicates that the United States needs to produce one million additional STEM professionals in the next decade in order to retain its historical preeminence in science and technology. The report proposes that addressing the retention problem in the first two years of college is the most promising and cost-effective strategy to address this need.¹ The California Community College System, with its 112 community colleges and 71 off-campus centers enrolling approximately 2.6 million students—representing nearly 25 percent of the nation's community college student population—is in a

prime position to help address the need to strengthen the future STEM workforce.² Community colleges serve as the gateway to higher education for large numbers of students in the U.S., especially minority and low-income students. For instance, almost three-fourths of all Latino and two-thirds of all African-American students who go on to higher education begin their postsecondary education in a community college.³ However, for many of these students the community college gateway does not lead to success. Recent findings on the achievement of California community college students indicate that only one in four students wanting to transfer or earn a degree/certificate did so within six years. African American and Hispanic students have even lower rates of completion; only 14% of African American students and 20% of Latino students completed a degree or certificate within six years, compared to 29% of white students, and 24% of Asian students.⁴

For science and engineering fields, lower success and retention rates for minority students are observed at both community college and university levels resulting in the underrepresentation of minority groups in these fields. For instance, while comprising about 28% of the U.S. population, African Americans and Latinos make up less than 9% of the individuals who are B.S. or higher-degree holders in the science and engineering fields.⁵ Statistics show that these groups of students tend to enroll in STEM majors in small numbers and have higher attrition rates compared to other groups.⁶⁻⁹ Summer programs are among the most commonly employed successful strategies that have been proven effective in increasing the retention and success of minority students in science and engineering, especially those who are educationally disadvantaged.¹⁰⁻¹⁶

In 2008, Cañada College, a Hispanic-Serving community college in Redwood City, CA, was awarded a Minority Science and Engineering Improvement Program (MSEIP) grant by the US Department of Education. The project, entitled Student On-ramp Leading to Engineering and Sciences (SOLES), aims to increase the participation, retention, and success of underrepresented and educationally disadvantaged students interested in pursuing careers in STEM fields. Among the strategies developed for this project is the Summer Math Jam – a two-week intensive mathematics program designed to improve students' preparation for college-level math courses. This paper summarizes the results of the implementation of the Math Jam and its one-week version, the Mini-Math Jam, over the last four years.

2. Incoming Student Interest and Level of Preparation for Engineering

Cañada College is a federally-designated Hispanic Serving community college in the San Francisco Bay Area. The College opened in 1968, and is located in Redwood City, California. During the 2011-2012 academic year, Cañada College enrolled 10,965 students. The student body is multi-cultural with Hispanic students as the largest single group at 35.5%; white students comprise 32.6%, Asians 8.1%, African-Americans 3.9%, Filipinos 3.6%, Pacific Islanders 1.7%, American Indian/Alaska Natives 0.3%, multi-racial 9.5%, unknown 4.9%.¹⁷ Like all of the California Community College System institutions, Cañada is an open-enrollment institution, designed to welcome students of all ages and backgrounds to higher education.

At Cañada College, low degree completion and transfer rates for STEM majors can in part be attributed to inadequate preparation for college-level mathematics courses. Table 1 summarizes the Math Placement test results of Cañada College students from April 2006 to April 2010.

Among all the students who took the placement test, 75.1% placed into either pre-algebra or algebra. For students who declared a STEM major, the results were only slightly better, with 59.6% of students placing into either pre-algebra or algebra. Even among those who declared engineering as their major, over 50% of students placed into one of these two remedial math courses. The results of these math placement tests have serious and adverse consequences for these students' timely completion of lower-division courses, and subsequent transfer to a university.

Table 1. Summary of April 2006 to April 2010 Math Placement Test results for 6300 students of all majors, 697 students who declared STEM majors, and 169 students who declared engineering majors.

Students Who:	Pre-algebra	Algebra	College Algebra	Trigonometry
Took Math placement Test	47.1%	28.0%	17.0%	7.9%
Declared a STEM major	32.9%	26.7%	23.8%	16.6%
Declared Engineering major	20.7%	32.0%	27.2%	20.1%

Table 2 summarizes the ethnic distribution of the math placement test results for students who declared a STEM major. Among the biggest ethnic groups, African American students have the lowest percentages of students placing into trigonometry (6.3%), and the highest percentages of students placing into pre-algebra (71.9%), followed by Mexican Americans with 12.5% placing into trigonometry, and 39.1% placing into pre-algebra.

Table 2. Ethnic distribution of Math Placement test results for students who declared majors in
STEM (Data from April 2006-April 2010; 697 students).

Ethnic Group	Pre-algebra	Algebra	College Algebra	Trigonometry	% of Total
African American	71.9%	15.6%	6.3%	6.3%	4.6%
Asian American	20.8%	22.9%	33.3%	22.9%	6.9%
Caucasian	22.9%	31.4%	24.8%	21.0%	30.1%
Mexican American	39.1%	26.2%	22.1%	12.5%	38.9%
Other	30.9%	24.3%	26.5%	18.4%	19.5%
All Ethnicities	32.9%	26.7%	23.8%	16.6%	100.0%

Although nationally, interest in science and engineering is lower for Latino, African American, and Native American students compared to other ethnic groups,⁵ this is not the case at Cañada College. Table 3 summarizes the percentages of students taking the placement test, students declaring STEM majors, students declaring an engineering major, and students who transferred to a four-year school as an engineering major (2006-2010) for the four largest ethnic groups – Mexican Americans, Caucasian, Asian Americans, and African Americans. Although Mexican Americans represent only 37.2% of all the students who took the placement test, they represent

38.9% of students who declared a STEM major, and 46.2% of students who declared engineering as their major. Despite such a high interest in engineering among Mexican Americans, they represented only 19.4% of all students who transferred to a four-year school as engineering majors from 2006-2010. These data clearly indicate a much lower rate of retention and transfer for Mexican Americans compared to Caucasian and Asian Americans.

The first two years of typical engineering curricula require two years of courses that include sequences of courses in calculus and physics. A student who starts at College Algebra has an additional one and a half years of mathematics (College Algebra, Trigonometry and Precalculus) on top of the two-year sequence of lower-division transferable courses. A student who starts at Pre-algebra has an additional two and a half years (Pre-algebra, Algebra, College Algebra, Trigonometry and Pre-calculus) of mathematics before they are ready to take Calculus. Hence, 39.1% of Mexican Americans and 71.9% of African American students will need at least four years at Cañada College before transferring. For many of them with family obligations and no family support, this is simply too long of an education path.

Table 3. Summary of the ethnic distribution of Cañada College students who took the placement test (April 2006-April 2010; 6,300 students), who declared STEM majors (697 students), who declared majors in engineering (169 students), and who transferred to a four-year school as engineering majors (2006-2010, 108 students) for the four largest ethnic groups.

Percentage of Students Who:	Mexican American	Caucasian American	Asian American	African American	Other
Took Math placement Test	37.2%	30.2%	5.7%	6.4%	20.5%
Declared a STEM major	38.9%	30.1%	6.9%	4.6%	19.5%
Declared Engineering major	46.2%	27.8%	4.1%	3.6%	18.3%
Transferred as Engr majors	19.4%	21.3%	30.6%	0.9%	27.8%

3. The Summer Math Jam

To address the low levels of preparation of incoming Cañada students, especially those who have expressed interest in pursuing engineering and other STEM majors but placed low in the sequence of math courses, the Summer Math Jam was developed in 2009.

The Summer Math Jam was developed with the following program goals:

- 1. Help students progress faster through Cañada's math sequence to enable them to transfer to a 4-year university earlier or to complete an associate's degree earlier;
- 2. Increase students' awareness of the tools, skills, and resources they need to be successful college students; and
- 3. Develop a community of learners among program participants.

Although originally developed to help students improve the results of their initial math placement tests, Math Jam has evolved a secondary purpose of helping students prepare for a math class that they will be taking. As a result, the program has welcomed repeat participants.

Math Jam participants are grouped into four levels based on students' initial math placement: one group each for Pre-algebra, Algebra and College Algebra, and one group for students in the Trigonometry level or higher. Each group is assigned a Math Jam instructor who is a math instructor, an instructional aide, or an advanced student. Each Math Jam instructor is assisted by a group of student tutors such that four or five students are assigned per tutor for the Pre-algebra group, and up to ten students per tutor for the Trigonometry group. Appendix A shows a summary of the schedule of activities for the 2009 Math Jam, and Appendix B the schedule from 2010 to 2012. All Summer Math Jam sessions were held from 9:00 a.m. to 3:00 p.m., Monday through Thursday during a two-week period that coincided with Cañada College's break between the end of the spring semester and the beginning of the summer term. Morning and afternoon sessions were devoted to studying math either in groups or individually using MyMathTest,¹¹ an online system developed by Pearson Education for developing math placement tests and short math refresher programs. Workshops related to resources and skills needed for college success are offered in the afternoon. As a result of a 2009 mid-program focus group, which indicated that students wanted to devote more time to studying math and less on these workshops, the afternoon college success workshops were made optional for the second week of the 2009 Math Jam and all subsequent Math Jam sessions.

Table 4 summarizes the demographics of Math Jam participants in the last four years. The number of participants more than doubled, from 50 in 2009 to 113 in 2010, and stayed at over 100 for 2011 and 2012. For each year, a majority of participants were female, with Hispanic being the predominant ethnic group. More than half of all Math Jam participants are first in their families to attend college.

Demographics	2009	2010	2011	2012
Number of Participants	50	113	111	129
Gender				
Female	64.7%	70.2%	63.0%	58.9%
Male	35.3%	25.8%	37.0%	41.1%
Ethnicity				
African American	5.9%	2.1%	5.4%	6.5%
Asian/Pacific Islander	2.9%	10.7%	7.2%	11.3%
Caucasian	20.6%	22.3%	23.4%	23.4%
Hispanic	61.8%	57.4%	55.9%	53.2%
Native American	0.0%	0.0%	0.0%	0.0%
Other	8.8%	7.5%	8.1%	5.7%
First in Family to Attend C	College?			
Yes	50.0%	54.8%	55.0%	55.7%
No	50.0%	45.2%	45.0%	44.3%

Table 4. Demographics of Summer Math Jam participants.

Table 5 is a summary of the results of the four years of implementation of Math Jam. Even though the number of participants more than doubled from 50 in 2009 to 113 in 2010, and remained above 100, the completion rate has remained above 80% for each year – 84% for 2009, 82% for 2010, 91% for 2011, and 82% for 2012. Among students who have pre- and post-program test scores, the percentage of students with higher post-program scores remained above 90% for each year. Among students who retook the placement at the end of the program, the percentage of students who placed into at least the next higher math level was consistently above 50% – 64% in 2009, 56%% in 2010, 69% in 2011, and 68% in 2012.

Summer Math Jam Results	2009	2010	2011	2012
Number of Participants	50	113	111	129
Number Completed	42	93	101	105
Completion Rate	84%	82%	91%	82%
With Pre- and Post-Test Scores	33	71	54	68
Improved Test Scores	94%	91%	96%	97%
% Placed into Higher Level	64%	56%	69%	68%

Table 5. Summary of Math Jam results in 2009, 2010, 2011 and 2012.

To evaluate the success of Math Jam in achieving its secondary goals of increasing student awareness of tools, skills and resources needed to succeed in college, pre- and post-program student surveys were administered. Table 6 summarizes student responses to the pre- and postprogram surveys for 2011 Math Jam and 2012 Math Jam. Note that the survey questions for 2009 and 2010 were different, and are not included in this summary. For most of the pre- and post-program attitudinal surveys, the survey prompt was: "Tell us how much you agree with the each of the following statements," with a Response Scale of: 5 - Strongly Agree, 4 - Agree, 3 -Neutral, 2 – Disagree, 1 – Strongly Disagree. The average of the student responses for each survey question was computed and is shown in Table 6. For both 2011 and 2012 surveys, the largest increase in the average response (and highest level of statistical significance) is for the prompt "I have effective math study skills." For the 2011 responses, statistically significant improvements from the pre-program responses to the post-program responses are also observed in two additional areas: students' perceived supportive relationships with tutors, and supportive relationships with teachers. For 2012, statistically significant improvements in the pre- and postprogram surveys are recorded for four areas in addition to math study skills. These additional areas are: confidence in succeeding in college, students' perceived supportive relationships with other students, supportive relationships with tutors, and supportive relationships with teachers. The recorded decrease in math anxiety and the increases in confidence that Cañada is the right college for them and confidence in selecting an appropriate major are not statistically significant. When asked if participation in Math Jam was helpful, student average responses were very positive (4.63 for 2011, and 4.62 for 2012). When asked if they were more likely to major in STEM as a result of participating in Math Jam, the average responses were 3.23 for 2011, and 3.46 for 2012.

Table 6. Pre- and Post Program Student Survey Results. Prompt: Tell us how much you agree with the following statements. Response Scale: 5 – Strongly Agree, 4 – Agree, 3 – Neutral, 2 – Disagree, 1 – Strongly Disagree.

Attitudos		2011			2012	
Autuues	Pre	Post	Δ	Pre	Post	Δ
I feel (was) excited about participating in Math Jam.	3.93	3.99	0.05	4.11	4.16	0.04
I feel anxious about studying math.	3.47	3.41	-0.06	3.43	3.40	-0.04
I have effective math study skills.	3.19	3.69	0.50 ^c	3.09	3.69	0.60 ^c
I am confident that I have the necessary skills and academic preparation to be a successful college student.	4.03	4.20	0.17	3.96	4.20	0.24 ^a
I am confident that Canada College is the right college for me.	4.21	4.32	0.12	4.35	4.39	0.04
I am confident that I have selected an appropriate major.	3.93	4.00	0.07	4.06	4.06	0.00
I have supportive relationships with other students at Cañada.	3.79	4.00	0.21	3.77	4.04	0.26 ^a
I have supportive relationships with tutors at Cañada.	3.67	4.03	0.36 ^a	3.55	3.99	0.44 ^c
I have supportive relationships with teachers at Cañada.	3.68	4.01	0.33 ^a	3.77	4.05	0.28 ^c
It was helpful for me to participate in MJ.	-	4.63	-	-	4.62	-
As a result of participating in MJ, I am now more likely to pursue a STEM major.	-	3.23	-	-	3.46	-

^a The change is statistically significant (p < 0.050).

^b The change is statistically significant (p < 0.010).

^c The change is statistically significant (p < 0.001).

4. Academic Performance of Math Jam Students

To truly evaluate the success of the Math Jam program in helping students achieve their academic goals, the success of the program participants beyond the two-week duration of the program needs to be monitored. To this end, the performance of the 2009 Math Jam participants in the math courses they took in fall 2009 was monitored. Table 7 is a comparison of the performance of three groups of students: 2009 Math Jam students who advanced at least to the next math class during Math Jam, 2009 MJ students who did not advance to the next math class during the program, and all students in fall 2009 math courses. The performance measures compared are the retention rate and success rates in the math courses. The last two columns of Table 7 show that 2009 Math Jam students when taken as a group have higher retention and success rates (75.7% and 62.2%, respectively) compared to all math students in the semester (74.5% and 50.5%, respectively). The third column of Table 7 shows that despite having already

skipped at least one math class, the MJ students who advanced outperformed all the math students in the semester, with higher retention rate (84.2% versus 74.5%), and success rate (68.4% versus 50.5%). These results address some initial concern among math faculty that skipping a math course might result in students being less prepared to be successful in the more advanced math course.

	MJ Students who Advanced (N=19)	MJ Students who did not Advance (N=18)	All MJ Students (N=37)	All Math Students (N=1515)
Retention Rate	84.2%	66.7%	75.7%	74.5%
Success Rate	68.4%	55.6%	62.2%	50.5%

Table 7. Performance of 2009 Math Jam students in fall 2009 math courses.

One of the primary reasons for the low degree-completion and transfer rates among community college students is the low persistence rates, i.e., students not continuing from one term to the next.¹⁹ Table 8 is a comparison of the persistence rates of all first time Cañada students and 2009 Math Jam participants. Over the last several years, a study of first time fall semester Cañada students shows persistence rates of 55% for the following spring semester, 38% for the fall of the following year and 32% for the spring semester of the second year. For the 2009 Math Jam participants, the corresponding persistence rates were 93% for spring 2010, 83% for fall 2010, and 78% for spring 2011. With much higher persistence rates, the degree-completion and transfer rates for these students are expected to be much higher as well.

Table 8. Comparison of persistence rates of all first time Cañada students and 2009 Math Jam participants.

	All First Time Students	2009 Math Jam Attendees
Fall of Yr 1	100%	100%
Spring of Yr 1	55%	93%
Fall of Yr 2	38%	83%
Spring of Yr 2	32%	78%

Two important variables that are commonly believed to strongly influence the retention of students are academic and social integration as articulated by Tinto's model of college student persistence/withdrawal based on these variables.^{20,21} It is often assumed that academic and social integration are more difficult to achieve in the community college setting because of the lack of time to participate in institutional activities that facilitate such integration.²² To enhance opportunities for the creation of academic and social integration, an approach that is of increasing popularity in community colleges is the use of learning communities. Learning communities are small groups of students who take thematically linked classes that are often interdisciplinary in order to enhance academic and social integration of students, and strengthen their cognitive skills.²³ Many studies have concluded that learning communities can significantly increase student retention, especially in developmental courses.²³⁻²⁸

The success of Math Jam in increasing the retention rate among its participants may be analyzed in the framework of Tinto's academic and social integration model. The intense two-week, 6 hours per day format of Math Jam provides an ideal context for academic and social integration among its participants, and may prove to be as effective as semester- or year-long learning communities programs that are commonly adopted in community colleges to improve student retention. Math Jam's informal instructional format of individual and group study sessions creates a relaxed and supportive learning environment. Additional opportunities for social/nonacademic interactions arise during snack and lunch breaks, and during optional afternoon workshops that explore students' strengths and weaknesses, as well as skills, resources and attributes important for college success. This creates a sense of integration and connectedness that is evident in the results of participant responses to the pre- and post-program surveys – statistically significant increases to student perceived supportive relationships with Math Jam tutors and with other participants.

5. Mini-Math Jam

Because of the success of the summer Math Jam, and student demand for it, Cañada College decided to offer Mini-Math Jam sessions. Mini-Math Jam is a one-week version of Math Jam offered a week before the beginning of the semester, and is designed to help students prepare for taking a math class during the semester. Since 2010, two Mini-Math Jam sessions per year have been offered, one in January and one in August, and the results are summarized in Table 9.

As with the two week Math Jam, the one week Mini-Math Jam completion rate has remained above 80% for each cohort. Among students who retook the placement at the end of the program, the percentage of students who placed into at least the next higher math level was above 50% for four of the six Mini-Math Jam cohorts.

Mini Math Iam Dagulta	2010		2011		2012	
	Jan	Aug	Jan	Aug	Jan	Aug
Number of Participants	87	74	107	113	168	130
Number Completed	76	67	87	93	142	106
Completion Rate	87%	91%	81%	82%	84%	82%
% Placed into Higher Level	36%	61%	69%	56%	61%	38%

Table 9. Summary of the results for the 2010 winter and 2010 summer mini-Math Jam.

6. Effect on STEM Enrollment

The success of the Math Jam and Mini-Math Jam programs has contributed to significant enrollment increases in transfer-level courses in math, sciences and engineering. Table 10 shows the percentage increases in enrollment in STEM courses among minority and non-minority students from fall 2008 to fall 2012. Since fall 2008, the base year of the Math Jam program, enrollments in transfer-level courses in math, engineering, biological and physical sciences have increased significantly. The percentage increase in the number of minority students enrolled in these courses is significantly higher than the percentage increase for the non-minority groups for both engineering (233.3% for minority students vs. 87.8% for non-minority students) and mathematics (224.4% for minority students vs. 173.3% for non-minority students). It should be noted that among the STEM areas, engineering, math and physics courses have higher prerequisite math courses beyond College Algebra. Enrollment in transfer-level courses in these subject areas is highly dependent on timely completion of the required sequence of math courses, a direct effect of successful participation in Math Jam. Over the same period, overall college enrollment increased by 5.0%, significantly lower than the increase for transfer-level STEM courses.

	Minority	Non-minority	All Students
Engineering	233.3%	87.8%	126.8%
Mathematics	224.4%	173.3%	189.8%
Chemistry	96.9%	174.6%	148.4%
Physics	55.6%	75.0%	69.3%
Biological Sciences	19.31%	27.1%	24.5%

Table 10. Comparison of percentage increase in enrollment in selected STEM areas for minority and non-minority students for fall 2012. All percentage changes are with respect to the program base year of fall 2008.

7. Conclusion

Through four years of implementation, Math Jam has been successful in achieving the program's primary goal of helping students progress faster through Cañada's math sequence. A majority of students who have pre- and post-program math placement test scores placed into at least the next higher math course. This results in a reduction of the cost and time for these students to complete their degrees and/or the lower-division courses they need to transfer to a four-year institution.

Math Jam has also been successful in increasing students' awareness of college success tools and skills, and in creating a community of learners that felt comfortable at Cañada. Academic performance of Math Jam participants in semesters following their participation in the program was significantly better both in the areas of retention and success rates, indicating the effectiveness of the program. Even more remarkable is the significantly higher persistence rate of Math Jam participants, with a one-year persistence rate that is double that of the College's rate among first-time students based on historical data. The improved persistence may be attributed to the enhanced academic and social integration experienced by Math Jam participants brought about by an intense and focused yet informal instructional atmosphere that fosters a sense of community among program participants, and a feeling of connectedness to the program staff and the College as a whole. These results indicate that shorter programs may be as effective as, or even more effective than traditional semester-long or year-long learning communities in creating opportunities for student engagement and immersion into the college experience in order to increase student persistence.

Math Jam was designed primarily to help students who have expressed interest in a STEM field but have low levels of preparation for taking college-level math courses as indicated by their math placement test results. Due to high interests in STEM and low placement test scores, participation in the program was higher among minority students compared to non-minority students. This higher rate of participation among minority students and the success of Math Jam in enhancing their academic performance are reflected in the increase in enrollment in transferlevel courses since the program was initiated. Although enrollments in STEM transfer-level courses have increased for all student groups and for all STEM areas, the rates of increase are significantly higher among minority students, especially for engineering, mathematics, and physics where minority student enrollment has traditionally been lower due to inadequate high school preparation in math.

The success of Math Jam has prompted Cañada College to institutionalize the program. Beyond the duration of the three-year Minority Science and Engineering Improvement Program grant that funds the Math Jam, the College will continue to implement and improve the program and contribute to the strengthening of the STEM educational pipeline for students from underrepresented groups. Additionally, through funding from the US Department of Education Hispanic Serving Institution Science, Technology, Engineering, and Mathematics (HSI STEM) program, an Evening Math Jam has also been developed for evening students who are unable to attend the day-time Math Jam. It was successfully implemented for the first time in summer 2012, with results similar to the day-time program. Other similar intensive programs have also been piloted at Cañada including Word Jam for students preparing to take an English or English-as-a-Second-Language (ESL) course, and Physics Jam for students preparing to take the first semester of college physics.

As more students choose the community college pathway towards careers in science, technology, engineering, and mathematics, more programs like Math Jam need to be developed in order to produce the well-educated work force that is needed to ensure that the United States remains the premier place in the world for innovation.

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<u>Appendix A</u> 2009 Math Jam Schedule

Week 1

	June 8	June 9	June 10	June 11	June 12	
Time	Monday	Tuesday	Wednesday	Thursday	Friday	
9-10 am	Welcome & Ice Breaker	Math Study Skills	Math	Mathl		
10 -12 pm	Placement Test / Review Results	Math!	Main:	Main!		
12-12:30 pm	Lunch	Lunch	Lunch		Lunch	
12:30-1 pm	Meet the staff & Overview of Math Jam	Math Anxiety Assessment	Financial Aid	Lunch & Mesa Panel		
1-1:30 pm	Time					
1:30-2 pm	Management				Field Trip	
2-2:20 pm	Why anEd PlanEducation Plan?Counseling O		Ed Plan Counseling OR	Learning Styles	r	
2:20-2:30 pm	Signups for Work Sessions	Workshop	Management			
2:30-3:00 pm [Optional]		Individual Ed Plan Counseling Skills Counseling	Individual Ed Plan Counseling Skills Counseling	Individual Ed Plan Counseling Skills Counseling		

Week 2

	June 15	June 16	June 17	June 18	June 19
Time	Monday	Tuesday	Wednesday	Thursday	Friday
9-10 am	Math!	Math!	Math!	Post-Program Survey	
10 -12 pm				Placement Test	
12-12:30 pm	Lunch	Lunch	Lunch	Laurah & Canad	
12:30-1 pm	IFAD			Lunch & Guest	Barbecue
1-1:30 pm	LEAP Strengths Quest			Speaker	and
1:30-2 pm	Suchguis Quest	Math!	Math!	Transfer OR	Closing
2-2.30 pm	Math Jam and			Graphing Calc	Ceremony
2-2.30 pm	You			Workshop	
2.30 3.00	Individual Ed	Individual Ed	Individual Ed	Individual Ed	
2.30-3.00	Plan Counseling	Plan Counseling	Plan Counseling	Plan Counseling	
[Ontional]	/ Skills	/ Skills	/ Skills	/ Skills	
[Optional]	Counseling	Counseling	Counseling	Counseling	

<u>Appendix B</u> 2010-2012 Math Jam Schedule

Week 1

Time	Monday	Tuesday	Wednesday	Thursday
9-10 am	Welcome & Pre- Program Survey	Math!	Math!	Math!
10 -12 pm	Placement Test / Review Results			
12-12:30 pm	Lunch	Lunch	Lunch	Lunch
12:30-2:30 pm	Math!	Math!	Math!	Math!
2:30-3:00 pm	Math!	Time Management or Math!	Math!	Math Anxiety or Math!

Week 2

Time	Monday	Tuesday	Wednesday	Thursday
9-12 pm	Math!	Math!	Math!	Math Placement Test Post-Program Survey
12-12:30 pm	Lunch	Lunch	Lunch	Lunch
12:30-2:30 pm	Math!	Math!	Math!	Group Photo
2:30-3:00 pm	Math!	Math!	Test Taking Strategy or Math!	Math!