

**Sabbatical Report**

**Fall 2007 Sabbatical**

**Matt Munro**

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## Statement of Purpose

The purpose of this sabbatical was two fold. First I wanted time to pursue advanced course work in mathematics at California State University at Fullerton. This represented 75% of my efforts. Second, I wanted to conduct a research project investigating the long term impact on students of participating in the math academy, a learning community which I organized beginning in 2002. Statistics on this impact had already been gathered by Maria Tsai at the Research and Institutional Effectiveness office at Mt. SAC, but I felt that our understanding would be considerably enhanced by personal interviews of some of the participants. So the remaining 25% of my sabbatical effort would go toward conducting those interviews and summarizing the results.

## Abstract of Sabbatical Proposal

My proposal is to combine 9 units of study in high level mathematics with a project centrally related to the ongoing development of learning communities at Mt. San Antonio College. The project will be to conduct interviews with former learning community participants to access the long term impact of the program on their lives, and produce a paper summarizing the results.

## Proposed Sabbatical Activity

I propose to combine study with a research project during a one semester sabbatical during the fall of 2007. Study and research would be split roughly 75% - 25%.

For the study portion, I will take 9 units of math courses at Cal. State Fullerton from the following list:

Math 581 Geometry for Teachers

Math 584 Analysis for Teachers

Math 586 Finite Math for Teachers

Math 587 Problem Solving for Teachers

Math 599 Independent Graduate Research

Math 503A and B Mathematical Modeling I and II

Math 471 Combinatorics

The remaining 25% of the sabbatical leave will be engaged in a research project on learning communities. I would like to use this time to supplement research that I'm already conducting as part of my Math Dept. – learning communities liaison assignment. The project would be to conduct follow-up interviews with former Math Academy students.

When the Math Academy (a learning community offered through the collaboration of the Math and Counseling departments) was first offered, we began an ambitious research program in which we examined success rates, retention, had a control group, and planned follow-up studies to examine success in future classes, transfer rates, and graduation rates. It has now been four years and we can begin to compile this type of follow-up data. I see this as one part of my job as the learning communities liaison for the Math Dept. However, in addition to the statistics mentioned above we also gathered student's opinions about their experiences in the Math Academy. Many of them used language indicative of a transformative experience;

*"If I could go to college all over again or even high school, there are so many things I would change...I probably learned more this semester than I have in my whole college career."*

*"I was ready to drop out of school. I hated school until the Academy"*

*"I'm going to tell you a secret... I enjoy math. I do! I'm not the best or Andrew Wiles, but to get an 88% when I failed (the class) twice!!!...I'm a new person! Dedicated not to fail."*

*“I feel more confident about my ability to achieve a good grade in a tough class. So, in the future, I will enroll in other challenging classes instead of avoiding them.”*

There were many more similar comments from students in the program.

I feel that it would add considerable insight into the long term impact of this learning community on these students to do follow-up interviews in addition to the statistics mentioned above. The goal would be to determine how the students view the program after the passage of time. Do they still mark it as a turning point in their lives, or was this feeling transitory?

Because of the time involved in tracking down former students, conducting interviews, and transcribing interviews, and the flexibility needed to schedule interviews, this project falls outside the realm of the 20% reassigned time I receive as liaison, and would be better done in the context of a sabbatical leave.

In addition, because my proposed project is connected so closely, I propose to continue my liaison assignment during my sabbatical. This would bring my compensation back to 100% (80% sabbatical + 20% liaison).

The products that I would produce to document the sabbatical activities would be a transcript from Cal. State Fullerton, complete transcripts of interviews conducted, and a paper on the long term impact of the Math Academy utilizing both follow-up statistics and the follow-up interviews.

## **Addendum to Sabbatical Application**

**By Matt Munro**

At the request of the Sabbatical and Leaves Committee, the following provides more information on the research part of my sabbatical leave proposal.

Goals: Many students who have participated in the Math Academy/Math Bridge program have described the experience as transformative. They say their approach to school has changed, they have a stronger belief in their own abilities, and they are more motivated to achieve their long term goals. I would like to discover how those feelings have stood up over time. The first participants have had 5 years to achieve those goals (or not). How do they feel, with hind sight, about the Math Academy experience? Was their approach to school really transformed? Or did they slip back into old patterns? Have they achieved their goals? If not, why? If so, do they credit their experience in the Math Academy as having a part? In other words, did the math academy just make them feel good about school in the short term or did it have a lasting impact?

Methodology: I would like to conduct person to person interviews with former Math Academy students from the first year of the program. There were about 60 of them. Of those, about 80% rated the Math Academy as a positive or very positive experience. About 25-30% described the program as having a transformative effect on their academic lives. Some students will be impossible to track down, others may not want to be bothered with an interview, but I hope to be able to interview 15 to 20 of the students who had the best experiences in the Math Academy.

I will tape the interviews, transcribe them, and summarize the information gained as part of a larger report on the efficacy of the Math Academy/Math Bridge program. This larger report will make use of data developed by the college research office and myself this spring and next fall, and will be useful to the college community as a whole in ongoing discussions about expanding and improving our learning communities programs.

## Benefit of Proposed Sabbatical Activity

The follow-up interviews that I'm proposing will add considerable depth to the study of the Math Academy. The resulting paper will be more interesting, and, if a significant long term impact is found, will be much more convincing to those who are considering adopting a similar model. This would enhance efforts to expand learning communities at Mt. SAC, and, if the paper is eventually published, would promote learning communities elsewhere. It will also serve to enhance the reputation of our learning communities programs.

The follow-up interviews will also serve to help us build on and improve our already successful program.

The course work I propose will enhance my knowledge of mathematics, give me new insight into teaching methods, and enable me to improve the quality of the content I offer in the classroom.

Revision to proposal

Sept. 6, 2007

To: Sabbatical Committee,

My Fall 2007 sabbatical leave requires me to complete 9 units of classes and a research project on learning communities. Due to scheduling conflicts and limited course offerings, it is impossible for me to take 9 units of course work from among the course listed in my original sabbatical leave proposal. I would like to there for add the following online courses (offered through Cal. State Fullerton Extension) to the list in order to complete the nine unit requirement;

“Early Childhood Mathematics” EDEL 934,

“Middle School Mathematics” MAED 901, and

“Toward Equity in Achievement” EDSC 934

The first two courses will be of use to me in teaching the math for future teachers class Math 210 which we are now offering. The third class is more of a general pedagogy course and will be useful to me in all my classes.

Each of these classes are 1 graduate unit.

Thank you,

Matt Munro

Student Name	Student Number	Date	Page
Matthew Jackson Munro	[REDACTED]	01-09-08	1 OF 1

Official Transcripts have a colored background. Photocopies are not to be considered Official Transcripts.

### Official Extended Education Academic Record

**Summer 2001** ----- (Extended Education)

DEPT/NO	COURSE TITLE	UNITS	GRD/PRV	FOOTNOTE	ENR TYP
MATH-582	Algebra For Teachers	(3.00)	A		Adjunct

**Spring 2005** ----- (Extended Education)

DEPT/NO	COURSE TITLE	UNITS	GRD/PRV	FOOTNOTE	ENR TYP
EDEL-X934	Dim of Learning Online	(3.00)	CR		Ext Credit
EDEL-X934	Multiple Intelligences	(3.00)	CR		Ext Credit
EDEL-X934	The Brain - Online ASCD	(2.00)	CR		Ext Credit

**Fall 2007** ----- (Extended Education)

DEPT/NO	COURSE TITLE	UNITS	GRD/PRV	FOOTNOTE	ENR TYP
EDEL-X934	Early Child Math	(1.00)	CR		Ext Credit
EDSC-X934	Toward Equity-Achievement	(1.00)	CR		Ext Credit
NAED-X901	ASCD Middle School Math	(1.00)	CR		Ext Credit
MATH-471	Combinatorics	(3.00)	A+		Adjunct
MATH-586	Studies in Discrete Math	(3.00)	A		Adjunct

**Extended Education Statistics and Degree(s)/Honors Awarded** -----

Summer 2001 to Fall 2007

	EARNED	GPA UN	GRD PT	GPA
CSUF	0.00	0.00	0.00	0.00
Cumulative	0.00	0.00	0.00	0.00

**Degrees Awarded:**

None Awarded

-----End of Extended Education Academic Record-----

END OF OFFICIAL TRANSCRIPT

ISSUED TO STUDENT

Matt Munro  
434 Elder Dr  
Claremont CA 91711

WHITE SIGNATURE APPEARS UPON BLUE SEAL

*Melissa K. Whatley*  
SIU  
Melissa K. Whatley, University Registrar

Changing Attitudes, Changing Habits, Changing Lives:

The Long Term Impact of the Math Academy

Matt Munro

Introduction:

During the spring semester 2002, math instructors and counselors at Mt. San Antonio College worked together to create a special program called the math academy. At the end of the semester, a number of students described participating in the program as a transformative experience. One student wrote "This program has changed not only my approach to school, but my approach to life." This paper will explore the long term impact of the math academy on the lives of participants. In particular, it will address the question of whether students' attitudes and behaviors really were transformed or whether their statements six years ago just reflected a temporary enthusiasm. Both quantitative and qualitative methods are used.

### Methodology:

The study consisted of two parts. The first was to examine data on success, degree completion, and transfer rates available through data bases at Mt. SAC. The assistance of the Research and Institutional Effectiveness office at Mt. SAC is gratefully acknowledged and appreciated. In particular, Maria Tsai collected and summarized all the quantitative data presented in this paper except where indicated otherwise. Her summary can be found in Appendix A. It should be noted that the term control group is used somewhat loosely. It implies for example that there was some sort of randomized assignment to the control and treatment groups. This was not the case. Students made their own choices about whether or not to enroll after being counseled about the intensive nature of the program and the commitment necessary for success. It can be argued that the control group and the math academy group are similar based on past grades and demographic characteristics, but there is no data that would allow motivation to be measured. Without randomized assignment, no mathematically valid claim of statistical significance can be made.

The second part consisted of personal interviews conducted by the author. Of the 33 students who passed both beginning and intermediate

algebra in the math academy, 21 indicated, in end of program evaluations, that their approach to school had changed for the better by their experience. 10 of these students were interviewed. In addition one student who did not pass intermediate algebra was also interviewed. The interviews were conducted either in person or by phone. The interviews were free ranging and any interesting issues raised by the former students were followed up. There were not specific prompts, but each interviewee was asked to provide the following information:

What was their approach to school before the math academy?

Did their approach to school change during the course of the math academy and how?

Have they continued to make use of the study skills and habits they worked on in the math academy? In particular have they continued to work in study groups?

The interviewees were also asked about what they have accomplished since 2002, as away of verifying information summarized by Maria Tsai in the first part of this study.

In many cases, the interviewees volunteered the desired information in answering other questions, so not every specific question was asked

in each interview. As an example, a transcript of one of the interviews can be found in appendix B.

All italicized quotes that follow are from these interviews. In the quotes there are occasionally words inserted to clarify the context. These insertions are indicated by brackets.

Note that this sample is very small and clearly not random. Interviewees were not chosen at random, but chosen based on their responses to end of term questionnaires in 2002. Further only those who could be located were interviewed. Those with more stable personal situations are more easily found and probably more likely to be successful. Thus no valid conclusions about statistical significance can be drawn.

### Background:

In 2000 and 2001, after several years experience with a phenomenally successful summer bridge, learning community program, a few instructors and counselors began to discuss how they might duplicate some of that success in a program offered during the regular semester. Out of these discussions the math academy was born. In the program students took both beginning and intermediate algebra in one semester. They also took a "community class" which was team taught by counselors and a math instructor. In the community class, students worked on general study skills, discipline specific study techniques, motivation, goal setting, and team building. They also participated in field trips to explore connections between math and other disciplines and to visit transfer institutions.

The math academy also integrated learner support in the form of supplemental instructors and peer advisors as well as the counselors who were assigned a class each as their case load. Math faculty, counseling faculty, supplemental instructors and peer advisors all worked together to reinforce the messages being sent about how to be an effective student. One of the skills most emphasized was the value of participating in study groups.

The program was very successful. In the first semester, in spring 2002, the success rates for beginning and intermediate algebra were 72.0% and 62.3% respectively. This compares to success rates of 40.2% and 39.7% for the sections of those classes that were not part of the program. In addition to higher success rates, students felt better about the program as well. In data gathered at the time by the author, over 50% of math academy students rated the experience as very positive, and over 30% rated it as somewhat positive. This compared to 13% and 19% who had rated their previous math experiences very positive or somewhat positive.

At the time most students seemed to recognize and enjoy the sense of community that the program was attempting to foster. While having lunch during a field trip to Harvey Mudd College, a student remarked, with a smile, "when I left the final of my last math class, I didn't know the name of a single other person in the class. Now I know the name of every single other person in this class."

### Success in later math classes:

The data tend to support the conclusion that the math academy made a difference in subsequent math classes. Among all math academy students, including those who didn't pass, 62.7% had successfully completed intermediate algebra at Mt. SAC by spring 2004. The figure for the control group was 44.4%. Among math academy students who passed both classes in the academy and who enrolled in statistics, 41.4% passed on the first attempt and 69.0% passed eventually. For the control group the figures were 41.2% and 76.5%. Among math academy students who passed both classes in the academy and who enrolled in college algebra, 58.3% passed on the first attempt and 75.0% passed eventually. The figures for the control group were 18.2% and 27.3%. It should be noted that the sample sizes are relatively small, so these numbers should be taken with a grain of salt.

### Academic success:

We can attempt to measure general success in college by looking at the rates of degree completion and transfer. For math academy students, 20.0% had been awarded a degree or certificate at Mt. SAC by the end of spring 2007. The figure for the control group was 17.5%. It should be noted again that these are small samples. Also it should be noted that a degree is not needed to transfer so many successful students are never awarded a degree including at least two of those interviewed for this paper.

53.4% of former math academy students transferred to a four year institution by spring 2007 (32 to the Cal. State system and 2 to Azusa Pacific). For the control group the figure was 41.3% (45 to the Cal State system and 7 to University of Phoenix).

The example of Sylvia, interviewed for this paper, illustrates the limitations of these statistics. She is clearly a successful former math academy student, but because of the long waiting period for the nursing program at Mt. SAC she went to Citrus College instead. So although she is now working as a nurse and credits the math academy as a pivotal experience in her education, she is not counted as a success in either of the above statistics. There is also a question about the

completeness of these data bases. During his interview Johnny stated that he transferred to UCSD, yet that transfer does not show up in the transfer statistics.

#### Changing Attitudes:

Of the 11 people interviewed 9 indicated that their attitudes towards school, their own abilities, or their goals changed during the math academy. In particular themes that came up frequently were a willingness to work harder, an understanding of the importance of hard work, taking school more seriously, and having more self confidence.

*"It was like I woke up, I think. Prior to [the math academy] I was just going through the motions... kind of just making it through and not pushing myself. I think [the program] made me realize how much I could do... Once I realized I could do that, it just opened up my sight to school in general because I didn't have that ambition. Or I had the ambition, but I didn't know how much I could really do. I underestimated myself over and over and over again. I didn't think I could do it. And then once I did it, I was just like that was really simple I should have done that a long time ago." Isela*

*"I was kind of wishy washy with going back to school. There was a lot going on in my life... I kept putting school off. I had done a little bit here and there, and then when it came time to do my math classes [in the math academy], I was like ok this is serious business now I need to really buckle down and do this." "Math was also a difficult subject for me and getting through it, that was a major accomplishment." "I think that [the math academy] really boosted my confidence." Sylvia*

*"I wanted to go into teaching, but the math was what was holding me up... I had a really bad experience [in algebra] with my teacher at the time and actually ended up failing the class. At that point I didn't really have a lot of confidence with my math skills... The math academy, I think, was one of the biggest steps toward me actually realizing that math isn't one of those things...that you either get or you don't get. It's kind of like learning a new language. You have to have a strong foundation in the intermediate skills and the lower skills in order to build upon that to understand the higher concepts in math. That was something that I'd always lacked and I think I was afraid*

*before and a little embarrassed that I lacked some of those skills."*

Elena

*"[During the math academy] I didn't mind going that extra step and staying after school...even for 2 or 3 hours...when before I was just trying to like get out of campus." Nadine*

*"It was eye opening for me...I thought it was going to be no problem...and it was challenging. It was a challenge that I met and I was proud of myself for that." Rachel*

*"[Before the math academy I was] not serious at all...What she told me that changed literally how I was as a person was that if I look at everything like it's negative, then I'm going to get a negative result... I started writing like almost affirmations before class...I think really staying positive...was a big thing." Rose*

### Changing Habits:

Interviewees were asked if they had continued to practice the study skills learned in the math academy after the program was over. In particular they were asked about study groups. Only 1 reported not using any of the study skills. The rest all claimed to have continued using these skills to varying degrees. There appeared to be a strong correlation between the degree of success each individual has achieved and the degree to which they have continued to utilize study groups and other study skills.

*"That's where it [study groups] started. I hadn't done that before [the math academy]. I hadn't studied with anybody before like that. Once I got used to it and knew how to do it and what do, I started using [study groups] all the time." Isela*

*"I did [do study groups] definitely, especially through nursing school and with the science classes. And it really makes a difference."*

Sylvia

*"The idea of learning by teaching...by being in study groups and doing that type of stuff it helps me understand that when you teach somebody something it really helps enforce it in your head and makes you understand it better. The same goes for other classes I've had where I was in study groups." Elena*

*"I didn't put enough effort on the second part - you know the tutoring was there. All the structure was there for me to be successful in the math academy, but I guess I didn't put enough effort to pass...In certain courses where I had issues I would notice who was doing well and I would make an effort to get to know that person, and meet up... to talk about our homework." Carlos*

*"I formed study groups in classes after [the math academy] as well. It really depended on the classes that we were taking...The study groups is actually a helpful...tool." "It did carry through to the UC program. I wasn't lazy anymore. I didn't cram. I followed the course material as it was being presented...I studied every night to try to improve my grade." Johnny*

*"I have [continued with study groups]. Particularly in my physics class...I think it's like really, really helpful." Joy*

*"[Study groups] helped me in graduate school. That's where I used it more." Nadine*

*"I use [collaboration] in my class room now as a teacher. It's really important...I made contact with someone in all my classes...At Fullerton I practiced what you guys taught us." Rachel*

*"I did [continue to use the study techniques]...I would make myself study a couple times during the week and not just when my class came about...Staying organized and put time into it. I started all kinds of study groups at the psych. Tech. program...You learn when you teach."  
"[The others in my study groups] all passed too." Rose*

*"I utilized study groups throughout my college career." Zulma*

## Changing Lives:

Every one of the 11 interviewees called the math academy a good or great program. 6 remembered it as one of the best experiences they'd had as an undergraduate. 5 of the former math academy students credited the math academy with playing a pivotal role in their academic career and even their lives.

*"Overall it was a very wonderful experience...It was very enlightening for me...I honestly believe that because of [the math academy] I was able to graduate from Mt. SAC and transfer." Zulma*

*"I wouldn't want to know [what I would have done with out the math academy]. The only reason I say that is because it set me up. It set me up for my future classes to do well or to want to do well. Not just take them and roll with the motions because that's what I was doing. I was taking my classes and just hoping for a C. I think the math academy made me expect an A." Isela*

*"At that point [in the math academy] was when I really set my mind to finish school. I was determined. I said 'I'm gonna do this'." "It really*

*gave me the kick in the butt I needed to really get going and not be so negative about school." Sylvia*

*"Even today I still talk to people about [the math academy]... I was a writing tutor for a year last year and I actually use very much the story of my problems with math and kind of compare it to a lot of students' problems with English." "Although I might not be the best at math...I definitely have an appreciation for it and a respect for it, and I don't think I would have gotten that with out the math academy." Elena*

*"I'm currently enrolled [in graduate school] at Claremont, of all places...It was kind of surreal for me. I remember when you took us on that field trip [to Harvey Mudd College], I thought that was a school that was so out of reach for me. I thought 'I would never go to a school like this'." Rachel*

### High expectations:

Three interviewees spoke about the high expectations of the program and how that had an impact on their own level of seriousness and, after experiencing success, their confidence.

*"It set a tone to say this is what we expect - no less, and so I think people kind of had to step up and do it." Isela*

*"I used to think you were so hard - not hard, but you had expectations and that was a good thing. Now I'm on the other side [a teacher now] and I have expectations of my students...I used to think how hard it was and that was just a taste of how difficult - not difficult but challenging school was for me. Rachel*

### Community:

7 of the former students remembered fondly the sense of community that they felt in the math academy. A number of them kept in touch with each other long after the program ended. Two of them even asked for contact information, so they could reconnect with

friends. (Do to privacy concerns regarding college records, this was not provided.)

*"Everybody in the class was aware of what you got and they were so interested because we were a community." "I loved it when we would study together and they would say 'I don't understand this' and you could explain it to them." Isela*

*"The whole group thing and working together just makes a difference when you're learning. You don't feel you're just learning this on your own." Sylvia*

*"Another thing about the math academy that I really took away from it is just how important it is to build bonds with other students in your classes." Elena*

*"The class was actually fun in that we all sort of bonded together in trying to complete that math course... It was pretty fun. It was a good environment we studied at school and we also studied outside of our class time." Johnny*

*"I think it was great. I thought it was really good. Just getting together with - seeing the same people everyday and working with them." Joy*

Support:

In addition to the connections made between students, 6 interviewees also spoke of the connections they felt with faculty and staff. Many of them mentioned by name people who were especially helpful. In particular they spoke of going back to counselors for help and advice long after they had finished the math academy.

*"I had never spoken to my counselor prior to [the math academy], and then I started speaking to him almost on a biweekly basis." Isela*

*"The way you guys put the academy together, it's very non-intimidating. It's very comfortable... You just feel like you're going to be successful. Sylvia*

*"The class gave me the kind of structure and the support to be able to take time and really understand that when you practice math and*

*when you really spend a lot of time with it that's really one of the ways that you really learn how to be good at it." Elena*

*"The counselor really helped me." Nadine*

*"I think I was an average student. I think I could have done better in school than what I did. I don't think I was supported a lot...at school and at home." "Many times I have reflected back on the math academy days...because I think you guys were very supportive...I enjoyed being in the math academy." Rachel*

*"Before I started the math academy...I feel my experience was kind of like accidental, because I did not have the guidance before... Just the whole program overall gave me a lot of guidance. I'm very thankful for everything that I basically went through in the math academy." Zulma*

Individual stories:

**Isela:** After graduating from high school in 1996, Isela attended Mt. SAC off and on for 6 years, but in that time still had not completed beginning algebra. After successfully completing the math academy in 2002, she completed her two year degree, transferred, and graduated from Cal. Poly. Pomona all within three years. She has been teaching third grade and kindergarten.

**Sylvia:** Originally Sylvia had wanted to go into nursing, but didn't think she could get through the science and math classes. She had settled on the idea of teaching, but after her success in the math academy she decided to give the science classes a try. After completing the requirements, she was accepted to the Mt. SAC nursing program, but with a two year wait. She enrolled in the nursing program at another community college, and is now working as a nurse. She is considering returning to school to complete a 4 year nursing degree.

**Carlos:** Carlos did not pass the second class in the math academy he eventually completed a two year degree at Rio Hondo College, and is currently starting a business administration program.

**Elena:** Math was a problem area for Elena. After succeeding in the math academy, she went on to transfer, earn her four degree, and enroll in graduate school. She is currently finishing her master's degree in English and this semester is teaching her first class. She wants to teach, write, and eventually earn her PhD.

**Johnny:** After success in the math academy, Johnny transferred to UCSD where he graduated with a double major in ethnic studies and visual arts. He currently works for a travel consulting firm.

**Joy:** After the math academy, Joy left school for a while due to "personal situations" in her life. She is back in school now and taking math 280 at Mt. SAC. She plans to transfer soon to Cal. Poly. Pomona in engineering. She credits the Harvey Mudd College field trip during the math academy with helping her to decide on engineering as a goal.

**Nadine:** After her success in the math academy, Nadine transferred, got her bachelor's degree, got a master's degree in counseling, and is now a high school guidance counselor.

**Rachel:** After succeeding in the math academy, Rachel transferred to Cal. State Fullerton and graduated with her bachelor's degree. She worked as a substitute teacher for 3 years. She is currently enrolled in graduate school in a credential and master's program.

**Rose:** After the math academy, Rose earned an AA, an AS and completed the Pysch. Tech. certificate program at Mt. SAC, and is currently working for a nonprofit in that field. She plans on returning to school at some point to get a nursing degree.

**Vanessa:** After the math academy, Vanessa transferred to Rio Hondo College and has now transferred to Cal. State LA.

**Zulma:** After the math academy, Zulma transferred to Cal. Poly. Pomona where she earned a degree in sociology. She is currently teaching and working on her credential.

### Conclusion:

Participation in the math academy in spring 2002 is associated with higher rates of degree completion and transfer. Among the students that were interviewed, all 11 still remember the math academy as a good or great program. 10 of the 11 interviewees credit the math academy with helping them make long term, positive changes in their approach to school. Many see the math academy as an important milestone in the academic career, and some even credit the math academy with changing their life. It is clear that it is possible, with the right structures, to have a huge impact in the lives of students, even in the context of a class (algebra) that is often seen as something that students just have to get through. A number of interviewees expressed the opinion that this type of program should be offered to more students, and the author agrees.

## Appendix A

### MATH ACADEMY Progress Study - Maria Tsai

MATH Academy is a learning community that provides assistance to students in completing the math requirements for an Associate of Arts degree or transferring to a four-year college. Offered for the first time in Spring 2002, this intensive 11-unit program allows students to complete both MATH52 and MATH72 within one semester and learn study and practice skills through a one unit community class that can aid them in their future college classes.

**Cohort:** Students who enrolled and received a valid grade (A,B,C,D,F,CR,NC,W,I) in special sessions of MATH52 and/or MATH72 in the MATH ACADEMY during Spring 2002 are included as cohort of this study. Students who also enrolled and received a valid grade in regular sessions of MATH52 or MATH72 of the same term are counted as the comparison group (the Control group).

A total of 75 students are included as the MATH ACADEMY cohort group and 160 students are part of the Control group. Tables 1 and 2 show the grade distribution and Success rates of MATH52 and MATH72 in Spring 2002 by the cohort and the Control groups. Success is defined as receiving letter grades of A, B or C. In both MATH52 and MATH72, the MATH ACADEMY cohort has much higher success rates than the Control Group.

Table 1. MATH52 Grade Distribution in Spring 2002

MATH52	A	B	C	D	F	W	Total	Success Rate
Math Academy	20	16	18	5	14	2	75	54
	26.7%	21.3%	24.0%	6.7%	18.7%	2.7%	100.0%	72.0%
Control	5	17	19	22	27	12	102	41
	4.9%	16.7%	18.6%	21.6%	26.5%	11.8%	100.0%	40.2%

Table 2. MATH72 Grade Distribution in Spring 2002

MATH72	A	B	C	D	F	W	Total	Success Rate
Math Academy	10	11	12	6	8	6	53	33
	18.9%	20.8%	22.6%	11.3%	15.1%	11.3%	100.0%	62.3%
Control	6	5	12	9	14	12	58	23
	10.3%	8.6%	20.7%	15.5%	24.1%	20.7%	100.0%	39.7%

Completion of MATH52 and MATH72

Table 3 shows the percentage of students from the cohort and the Control groups who completed both MATH52 and MATH72 between Spring 2002 and Spring 2004. About 63% of the total MATH Academy cohort completed both courses within the two year time frame, comparing to 44% of those from the Control Group.

Table 3. Completion of MATH52/72 by Spring 2004

Completion of MATH52 and MATH72		Completion	
Group	Cohort	Count	Percent
MATH ACADEMY	75	47	62.7%
Control Group	160	71	44.4%

To demonstrate how the MATH52/72 completers from both groups went through in completing these two courses, Table 4 lays out their exact paths to completion.

Table 4. Paths of MATH52/72 Completion

	First MATH52		Repeat MATH52		First MATH72		Repeat MATH72				
<b>Math Academy</b>	75 Attempts	54 Pass	0		53 Attempts	33 Pass		0			
						20 No Pass		13 Attempts	10 Pass 3 No Pass		
	21 No Pass	8 Attempts	4 Pass 4 No Pass		4 Attempts	2 Pass		0			
						2 No pass		2 Attempts	2 Pass 0 No Pass		
						N/A		N/A			
<b>Control</b>	102 Attempts	41 Pass	0		41 Attempts	18 Pass		0			
						23 No Pass		15 Attempts	6 Pass 9 No Pass		
						2 pass		0			
	61 No Pass	22 Attempts	17 Pass 5 No Pass		17 Attempts	15 No Pass		12 Attempts	7 Pass 5 No Pass		
						58 Attempts		23 Pass		0	
						23 Pass		0			
						35 No Pass		22 Attempts	15 Pass 7 No Pass		

### Performance at College Level MATH Courses

Many MATH52/72 completers from both groups had moved on taking various college level math courses. The following tables show attempts in MATH110 and MATH130 only because although some students had attempted other college level math courses, the numbers are too small to provide any valid percentage comparison.

Twenty-nine students from the Math Academy cohort and 52 students from the Control group who completed MATH52/72 courses had attempted MATH110 (Elementary Statistics). For Math Academy group, twenty students passed the course with 12 succeeded on the first attempt, 7 on the 2<sup>nd</sup> attempt, and one on the 3<sup>rd</sup> attempt. For the Control group, 39 students passed the course with 21 succeeded on the first attempt, 14 on the 2<sup>nd</sup> attempt, and 4 on the 3<sup>rd</sup> attempt. The success rates for both groups in taking MATH110 are similar on the first attempts; however, the Control group has a higher overall success rate than the Math Academy group.

Table 5. Overall Success Rates in MATH110

<b>Overall Success Rate in MATH110</b>	Success		
	No Pass	Pass	Total
MATH ACADEMY 52/72 Completers (N=47)	9 31.0%	20 69.0%	29 100.0%
Control Group 52/72 Completers (N=71)	12 23.5%	39 76.5%	52 100.0%

Table 6. Success Rates in MATH110 by Number of Attempts

<b>Success Rates in MATH110 by Number of Attempts</b>	Student Count	Pass on 1 <sup>st</sup> attempt	Pass on 2 <sup>nd</sup> attempt	Pass on 3 <sup>rd</sup> attempt	Did not pass
MATH ACADEMY 52/72 Completers (N=47)	29	12	7	1	9
	100.0%	41.4%	24.1%	3.4%	31.0%
Control Group 52/72 Completers (N=71)	51	21	14	4	12
	100.0%	41.2%	27.5%	7.8%	23.5%

For attempts in MATH130 (College Algebra), although MATH Academy cohort appears to be much more successful in passing the course than the Control group, the data is too small in size to be sufficient for conclusion.

Table 7. Overall Success Rates in MATH130

<b>Overall Success of in MATH130</b>	Success		
	No Pass	Pass	Total
MATH ACADEMY 52/72 Completers (N=47)	3	9	12
	25.0	75.0%	100.0%
Control Group 52/72 Completers (N=71)	8	3	11
	72.7%	27.3%	100.0%

Table 8. Success Rates in MATH130 by Number of Attempts

<b>Success Rates in MATH130 by Number of Attempts</b>	Student Count	Pass on 1 <sup>st</sup> attempt	Pass on 2 <sup>nd</sup> attempt	Pass on 3 <sup>rd</sup> attempt	Did not pass
MATH ACADEMY 52/72 Completers (N=47)	12	7	2	0	3
	100.0%	58.3%	16.7%	0.0%	25.0%
Control Group 52/72 Completers (N=71)	11	2	1	0	8
	100.0%	18.2%	9.1%	0.0%	72.7%

### Other Outcome Measures

This study also looked into other outcome measures such as earning an Associate degree or Certificate or transferring to four-year institution of these two groups. By the end of Spring 2007, 20% of the Math Academy cohort and 17.5% of the Control Group have earned an Associate degree or Certificate. Many Mt. SAC students with a goal to transfer to four year institution tend to not apply for an Associate degree, even though they are qualified in receiving one. This may explain partly the low percentage in graduation rate.

Table 10. Mt. SAC Associate Degree/Certificate Award Recipients

<b>Graduation Awards</b>	Cohort Count	Award Recipients	Grad Rate	AA	AS	CC	Total Awards
Math Academy Group	75	15	20.0%	11	1	3	15
Control Group	160	28	17.5%	22	2	11	35

The complete name lists from the Math Academy and the Control groups were sent to National Student Clearinghouse to track these students' attendance in other institutions after leaving Mt. SAC. With some limitations on the NSC database, fifty students from the Math Academy and 84 students from the Control group were found to have records of attending other institutions. Many students transferred directly from Mt. SAC to four year institutions but some transferred first to other two year colleges and then to four year institutions. Some students had simply transferred out to other two year colleges. The following table shows the counts and transfer rates of these transfer patterns by these two groups. The Math Academy cohort has a higher transfer rate to four year institution than the Control group and is more likely to transfer to other two year colleges than the Control group.

Table 11. Transfer Rates by Transfer Pattern

Transfer Rates	Cohort Count	Transfer Record to Other Institution	Transfer to 4 Year Institution only		Transfer to both 2 & 4 Year Institution		Transfer to 2 yr institution only		Overall Transfer Rate to 4 YR Institution	
			#	%	#	%	#	%	#	%
Group	#	#	#	%	#	%	#	%	#	%
Math Academy Group	75	50	29	38.7%	11	14.7%	10	13.3%	40	53.4%
Control Group	160	84	51	31.9%	18	11.3%	15	9.4%	69	41.3%

The following tables show the top list of institutions where students of the MATH ACADEMY and the Control group have transferred to.

MATH Academy

Institution Name	Two Year	Four Year	Grand Total
CALIFORNIA STATE UNIVERSITY - FULLERTON		15	15
CALIFORNIA STATE POLYTECHNIC		9	9
CITRUS COLLEGE	6		6
CHAFFEY COMMUNITY COLLEGE	6		6
RIO HONDO COLLEGE	5		5
CALIFORNIA STATE UNIVERSITY - LOS ANGELES		5	5
CALIFORNIA STATE UNIVERSITY - SAN BERNARDINO		3	3
AZUSA PACIFIC UNIVERSITY		2	2

### Control Group

<b>Institution Name</b>	<b>Two Year</b>	<b>Four Year</b>	<b>Grand Total</b>
CALIFORNIA STATE UNIVERSITY - FULLERTON		21	21
CALIFORNIA STATE POLYTECHNIC		12	12
CITRUS COLLEGE	8		8
UNIVERSITY OF PHOENIX -		7	7
CALIFORNIA STATE UNIVERSITY - LOS ANGELES		6	6
CALIFORNIA STATE UNIVERSITY - SAN BERNARDINO		6	6
RIO HONDO COLLEGE	6		6
FULLERTON COLLEGE	5		5

## Appendix B

### Interview by Matt Munro of former student Elena.

M: You were enrolled in the math academy. I believe it was spring 2002. Could you describe your approach to school before the math academy, if you can remember back that far?

E: My approach to school in general or my approach for math?

M: Both.

E: OK. In school in general I had always had a pretty strong hold on my education. I was always pretty driven. I knew kind of what I wanted to do, what direction I wanted to go. I wanted to go into teaching, but the math was kind of holding me up. I kind of changed my - When I was at Mt. SAC, I kind of changed what I thought my major was going to be because I initially wanted to maybe go into something that might have been more mathematical - you know needing more of a mathematics background. And then when I realized that I didn't have any confidence, I wasn't really doing that well and I changed majors. But as far as the math went, I had took the math test to see where I'd be placed. I placed right below algebra, college algebra. So I went into it and I had a really bad experience with my teacher at the time and I actually ended up failing the class. At that point I didn't really have a lot of confidence in my math skills.

M: During the math academy did that change?

E: Oh, definitely. Even today I still talk to people about it. I'm currently finishing up my master's in English and I'm actually teaching as a T. A. at Cal. State Fullerton while I'm doing it, and so I obviously had to go higher in my math for my degree. My degree was in liberal studies, but I also minored in English. The math academy, I think, was one of the biggest steps toward me actually realizing that math isn't one of those things that I had assumed before was just one of those things you either get or you don't get. It's kind of like learning a new language. You have to have a strong foundation in the, I guess, the intermediate skills and the lower skills in order to build upon that to understand the higher concepts in math and that was something that I'd always lacked and I think I was afraid before and a little embarrassed that maybe I lacked some of those skills that were maybe lower on the totem pole as far as math ability. And the class gave me the kind of structure and the support to be able to take time and be able to understand that when you practice math and when you really spend a lot of time with it that's really one of the ways that you really learn how to be good at it, and to build confidence. Once you build that confidence it's easier for you to, you know, work on those higher math skills. So I definitely - I mean I still talk to people today about it and a lot of my students that I talk to in English - I was a writing tutor for a year last year and I actually use very much the story of my problems with math and kind of compare it to a lot of students' problems with English.

M: I see.

E: And to grasp, just to grasp the subject and to kind of have an appreciation and respect for it even if you don't like it and I think that once I learned to

have respect for it and appreciation for it, to see how much it was a part of everyday aspects of my life that I didn't think it was then that's when I think I started to really enjoy it.

M: Do you recall what the next math class you took after the math academy was?

E: I took college algebra that summer. That semester I took the math academy and then that summer, because I wanted to finish my associate's degree and go to Fullerton the next fall, I did, actually I did college algebra that summer time. It was still pretty rigorous and strenuous. It was - I don't remember exactly how many hours a day it was, but it was 4 times a week and I think it was about 3 hours a day.

M: Yes, fast paced.

E: Yes. So it was fast paced just like the math academy, but I think I learned that - To me I think that, I don't know, for college classes especially with math and English, I think that a lot of students don't practice outside of the classroom unless they're forced to. And the math academy forced me, forced me, 4 hours a day I think it was, to actually sit there and practice math. And I still think that was something that a lot of students don't get and they don't do it on their own so...

M: Right.

E: I think the fast paced part of it was good because you were constantly building on everything and so when I went into math, ah, college algebra, the class in summer, I was - I felt really prepared for it.

M: And how did you do in that class, if you don't mind me asking?

E: I can't remember. I know it was at least a B, if not an A. And then once I got to Cal. State Fullerton, for the liberal studies degree, you need a year of math after that. I think it's called applying mathematics for elementary school teachers. And it's the kind of class you take in order to understand how math works, and breaking down even like subtraction and addition, division, looking at what base we use in math, using base 10, using different bases. So it was good because it a way for us to look at why we, how we go about learning math and whether or not there's different approaches that students might take to figuring out the same problem. So it was a lot more analytical.

M: OK. Now you majored in English and you're in grad. school now?

E: Yes.

M: What are you planning to do when you finish?

E: I'm going to be graduating this spring with my master's in English and I hope to teach. Eventually I want - I want to write too. I'm part of the creative writing club on campus. We had a - or we published our journal last spring

for the first time and I was a senior editor on that and - So I really want to continue writing, and eventually, while working, I want to get my Ph. D.

M: OK. Good. During the math academy with the students, we worked with you and others on a variety of different study techniques.

E: I'm sorry. What was the question?

M: I'm sorry. I'm on a speaker phone, so it's hard to tell if I'm talking loud enough or not, but - During the math academy, we worked with the students on a number of different study techniques. In particular, we had you guys working in study groups. You remember that?

E: Yes.

M: And did you, after you left the math academy, did you continue to do study groups in any of your classes?

E: In other classes?

M: Yes.

E: Yes, actually I still did them. I remember I made really good - Another thing about the math academy that I really took away from it is just how important it is to build bonds with other students in your classes. Which, I think, especially at a junior college, it's kind of hard to do that because of the commuting and what not. But, when I took it in the summer, I right away

made sure to try to find other people that I could study with, because I really did see the importance of it and it was - To me, I think one of the benefits of the math academy too was that I took away from it is the idea of kind of learning by teaching technique I guess you could say. I don't really know what it would actually be called, but I remember in class we were really kind of encouraged to help other people that weren't getting certain problems correct or weren't kind of grasping concepts. And I think you or somebody kind of facilitated saying like "well hey, if your other peers aren't getting it" then you said "then you should help try to get them to understand." So by kind of being in study groups and doing that type of stuff it really helped me understand that when you teach somebody something it really helps enforce it in your head and makes you understand it better. And the same goes for other classes I had where I was in study groups. So I definitely utilized the group studying and all that.

M: Good. Is there anything else you'd like to add about your experience?

E: I think that overall the whole math academy experience was wonderful. And I think it's something that I even now talk to people about, and I'm not sure if anything like it is still going on, but I definitely think it's something that should be considered at any college. Because, I think, like I said earlier, you know, being a commuter student and the fact that I think that just in general math and English skills and competency are kind of dwindling and students are just kind of going in and going through the motions and maybe just getting through, you know, subjects like math and English, maybe not actually find an appreciation for them and seeing how they're really things that you're going to see in any part of your life. And so if you don't really try

to practice it and at least appreciate and understand the concepts then it's really going to kind of - It's not going to be beneficial for you. So I definitely - Although I might not be the best at math or I might not ever understand it in the ways that other people that just love math and that would, I definitely have an appreciation for it and respect for it. And I don't think I would have gotten that without the math academy.

M: OK. Thank you.

E: You're welcome.

## Conclusion and Statement of Value to Mt. SAC

During the fall semester 2007, I was able to complete, as part of my sabbatical, 9 units of course work at California State University at Fullerton. Combinatorics and Studies in Discrete Math are two classes that touch upon topics that are part of our Math 100 and Math 110 classes at Mt. SAC. Of course these topics are addressed in an advanced and theoretical way, but having such a level of knowledge will assist me in presenting lessons to beginning students and answering the occasional more advanced question. The classes Early Childhood Mathematics and Middle School Mathematics are essentially advanced studies of many topics that appear in our Math 210 class. The information and ideas presented in these classes will assist me in curriculum development for Math 210 as well as preparing and presenting lessons. The class Toward Equity in Achievement was a more general course on pedagogy that addressed what's known as the achievement gap in performance of different demographic groups. Ideas about these issues are of great value on a diverse campus like Mt. SAC.

An unexpected benefit of this course work was the opportunity to observe two very good math professors practice their craft. As a student who is also a teacher, I was able to observe these classes on levels beyond just the content of the classes. My professors, while both very good, had totally different teaching styles. It was interesting to compare and contrast they way in which they managed their classrooms, and I was able to pick up a number of ideas that I can use in my classes at Mt. SAC.

I also completed a research project on the long term impact of the math academy that consisted of interviewing some of the students who had participated 5 years previously. I was overly ambitious in my proposal. I had

hoped to be able to interview 15 to 20 students, but I was only able to track down 11 of them. Also, I wildly underestimated the difficulty in transcribing the interviews. So, instead of completing transcriptions of all the interviews, I have transcribed one interview as a sample and collected relevant quotes from the others to include in my summary. Never the less, this project was a success and confirms my belief that, at least for some students, learning communities programs like the math academy can be transformative experiences. These results serve to affirm and reinforce the commitment Mt. SAC has made to expanding learning communities.

Over all I feel that my sabbatical work was successful and worthwhile.

1. Some spelling/grammatical errors. Table of Contents is mislabeled as 'Index'. No statement of purpose.
2. Poor description of the research design and protocol. Did not include the interview prompts/protocol. Included some sample student comments, but did not include transcripts as promised (should have at least 1 – 2 full transcripts as an appendix?)
3. For quantitative data, need to include more specific information ("n" for each, test values, are any of the comparisons statistically significant?) There is no description of the control groups for each comparison. Perhaps tables would be a good way to display the data, then provide interpretations and limitations of the study within the narrative.
4. For qualitative data, there appears to be no attempt at any qualitative analysis method (some thematic analysis, but not supported with any frequency of response.) There are numerous statements such as "many students reported...", "a few students credited the Math Academy with...", "a number of interviewees expressed...." --- no frequency analysis of any sort. If transcripts are still in existence, recommend that he work with RIE to learn an appropriate analysis protocol, and then report results from the analysis more specifically.
5. Conclusions are very general and speak about positive feelings, but the answer to the study's central research question is not conclusively answered: to what extent was the students' view of the math academy experience affected by the passage of time? Is there any way to document exactly how many students still found it transformative, how many were still utilizing the habits/skills developed in the math academy, etc.?
6. Overall, the report is not delivered as scholarly research commensurate with the kind of professional study expected of an individual at a post-graduate level.
7. The "paper" he produced doesn't constitute the report in terms of fulfilling all requirements. He needs to provide a statement of the value of his sabbatical (including coursework and project) to the college.

12/9/08 - Met w/matt and reviewed above concerns. Conveyed deadline for report revisions of Feb 20, 2009

D. Bowd

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**Sabbatical Report**

**Fall 2007 Sabbatical**

**Matt Munro**

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## Abstract of Sabbatical Proposal

My proposal is to combine 9 units of study in high level mathematics with a project centrally related to the ongoing development of learning communities at Mt. San Antonio College. The project will be to conduct interviews with former learning community participants to assess the long term impact of the program on their lives, and produce a paper summarizing the results.

## Proposed Sabbatical Activity

I propose to combine study with a research project during a one semester sabbatical during the fall of 2007. Study and research would be split roughly 75% - 25%.

For the study portion, I will take 9 units of math courses at Cal. State Fullerton from the following list:

Math 581 Geometry for Teachers

Math 584 Analysis for Teachers

Math 586 Finite Math for Teachers

Math 587 Problem Solving for Teachers

Math 599 Independent Graduate Research

Math 503A and B Mathematical Modeling I and II

Math 471 Combinatorics

The remaining 25% of the sabbatical leave will be engaged in a research project on learning communities. I would like to use this time to supplement research that I'm already conducting as part of my Math Dept. – learning communities liaison assignment. The project would be to conduct follow-up interviews with former Math Academy students.

When the Math Academy (a learning community offered through the collaboration of the Math and Counseling departments) was first offered, we began an ambitious research program in which we examined success rates, retention, had a control group, and planned follow-up studies to examine success in future classes, transfer rates, and graduation rates. It has now been four years and we can begin to compile this type of follow-up data. I see this as one part of my job as the learning communities liaison for the Math Dept. However, in addition to the statistics mentioned above we also gathered student's opinions about their experiences in the Math Academy. Many of them used language indicative of a transformative experience;

*"If I could go to college all over again or even high school, there are so many things I would change...I probably learned more this semester than I have in my whole college career."*

*"I was ready to drop out of school. I hated school until the Academy"*

*"I'm going to tell you a secret... I enjoy math. I do! I'm not the best or Andrew Wiles, but to get an 88% when I failed (the class) twice!!!...I'm a new person! Dedicated not to fail."*

*“I feel more confident about my ability to achieve a good grade in a tough class. So, in the future, I will enroll in other challenging classes instead of avoiding them.”*

There were many more similar comments from students in the program.

I feel that it would add considerable insight into the long term impact of this learning community on these students to do follow-up interviews in addition to the statistics mentioned above. The goal would be to determine how the students view the program after the passage of time. Do they still mark it as a turning point in their lives, or was this feeling transitory?

Because of the time involved in tracking down former students, conducting interviews, and transcribing interviews, and the flexibility needed to schedule interviews, this project falls outside the realm of the 20% reassigned time I receive as liaison, and would be better done in the context of a sabbatical leave.

In addition, because my proposed project is connected so closely, I propose to continue my liaison assignment during my sabbatical. This would bring my compensation back to 100% (80% sabbatical + 20% liaison).

The products that I would produce to document the sabbatical activities would be a transcript from Cal. State Fullerton, complete transcripts of interviews conducted, and a paper on the long term impact of the Math Academy utilizing both follow-up statistics and the follow-up interviews.

## **Addendum to Sabbatical Application**

**By Matt Munro**

At the request of the Sabbatical and Leaves Committee, the following provides more information on the research part of my sabbatical leave proposal.

Goals: Many students who have participated in the Math Academy/Math Bridge program have described the experience as transformative. They say their approach to school has changed, they have a stronger belief in their own abilities, and they are more motivated to achieve their long term goals. I would like to discover how those feelings have stood up over time. The first participants have had 5 years to achieve those goals (or not). How do they feel, with hind sight, about the Math Academy experience? Was their approach to school really transformed? Or did they

slip back into old patterns? Have they achieved their goals? If not, why? If so, do they credit their experience in the Math Academy as having a part? In other words, did the math academy just make them feel good about school in the short term or did it have a lasting impact?

Methodology: I would like to conduct person to person interviews with former Math Academy students from the first year of the program. There were about 60 of them. Of those, about 80% rated the Math Academy as a positive or very positive experience. About 25-30% described the program as having a transformative effect on their academic lives. Some students will be impossible to track down, others may not want to be bothered with an interview, but I hope to be able to interview 15 to 20 of the students who had the best experiences in the Math Academy.

I will tape the interviews, transcribe them, and summarize the information gained as part of a larger report on the efficacy of the Math Academy/Math Bridge program. This larger report will make use of data developed by the college research office and myself this spring and next fall, and will be useful to the college community as a whole in ongoing discussions about expanding and improving our learning communities programs.

## Benefit of Proposed Sabbatical Activity

The follow-up interviews that I'm proposing will add considerable depth to the study of the Math Academy. The resulting paper will be more interesting, and, if a significant long term impact is found, will be much more convincing to those who are considering adopting a similar model. This would enhance efforts to expand learning communities at Mt. SAC, and, if the paper is eventually published, would promote learning communities elsewhere. It will also serve to enhance the reputation of our learning communities programs.

The follow-up interviews will also serve to help us build on and improve our already successful program.

The course work I propose will enhance my knowledge of mathematics, give me new insight into teaching methods, and enable me to improve the quality of the content I offer in the classroom.

Revision to proposal

Sept. 6, 2007

To: Sabbatical Committee,

My Fall 2007 sabbatical leave requires me to complete 9 units of classes and a research project on learning communities. Due to scheduling conflicts and limited course offerings, it is impossible for me to take 9 units of course work from among the course listed in my original sabbatical leave proposal. I would like to there for add the following online courses (offered through Cal. State Fullerton Extension) to the list in order to complete the nine unit requirement;

“Early Childhood Mathematics” EDEL 934,

“Middle School Mathematics” MAED 901, and

“Toward Equity in Achievement” EDSC 934

The first two courses will be of use to me in teaching the math for future teachers class Math 210 which we are now offering. The third class is more of a general pedagogy course and will be useful to me in all my classes.

Each of these classes are 1 graduate unit.

Thank you,

Matt Munro

# California State University, Fullerton

Admissions and Records  
Fullerton, California 92834-6900

# Academic Transcript

Student Name

Student Number

Date

Page

Matthew Jackson Munro

800-03-4969

01-09-08

1 OF 1

XXX-XX-2258

Official Transcripts have a colored background. Photocopies are not to be considered Official Transcripts.

## Official Extended Education Academic Record

### Summer 2001----- (Extended Education)

DEPT/NO	COURSE TITLE	UNITS	GRD/PRV	FOOTNOTE	ENR TYP
MATH-582	Algebra For Teachers	(3.00)	A		Adjunct

### Spring 2005----- (Extended Education)

DEPT/NO	COURSE TITLE	UNITS	GRD/PRV	FOOTNOTE	ENR TYP
EDEL-X934	Dim of Learning Online	(3.00)	CR		Ext Credit
EDEL-X934	Multiple Intelligences	(3.00)	CR		Ext Credit
EDEL-X934	The Brain - Online ASCD	(2.00)	CR		Ext Credit

### Fall 2007----- (Extended Education)

DEPT/NO	COURSE TITLE	UNITS	GRD/PRV	FOOTNOTE	ENR TYP
EDEL-X934	Early Child Math	(1.00)	CR		Ext Credit
EDSC-X934	Toward Equity-Achievement	(1.00)	CR		Ext Credit
MAED-X901	ASCD Middle School Math	(1.00)	CR		Ext Credit
TH-471	Combinatorics	(3.00)	A+		Adjunct
TH-586	Studies in Discrete Math	(3.00)	A		Adjunct

### Extended Education Statistics and Degree(s)/Honors Awarded-----

Summer 2001 to Fall 2007

	EARNED	GPA UN	GRD PT	GPA
CSUF	0.00	0.00	0.00	0.00
Cumulative	0.00	0.00	0.00	0.00

### Degrees Awarded:

None Awarded

### -----End of Extended Education Academic Record-----

END OF OFFICIAL TRANSCRIPT

ISSUED TO STUDENT

Matt Munro  
434 Elder Dr  
Claremont CA 91711

WHITE SIGNATURE APPEARS UPON BLUE SEAL

*Melissa K. Whatley*  
Melissa K. Whatley, University Registrar

Changing Attitudes, Changing Habits, Changing Lives:

The Long Term Impact of the Math Academy

Matt Munro

Introduction:

During the spring semester 2002, math instructors and counselors at Mt. San Antonio College worked together to create a special program called the math academy. At the end of the semester, a number of students described participating in the program as a transformative experience. One student wrote "This program has changed not only my approach to school, but my approach to life." This paper will explore the long term impact of the math academy on the lives of participants. In particular, it will address the question of whether students' attitudes and behaviors really were transformed or whether their statements six years ago just reflected a temporary enthusiasm. Both quantitative and qualitative methods are used.

### Methodology:

The study consisted of two parts. The first was to examine data on success, degree completion, and transfer rates available through data bases at Mt. SAC. The assistance of the Research and Institutional Effectiveness office at Mt. SAC is gratefully acknowledged and appreciated. In particular, Maria Tsai collected and summarized all the quantitative data presented in this paper except where indicated otherwise.

The second part consisted of personal interviews conducted by the author. Of the 33 students who passed both beginning and intermediate algebra in the math academy, 21 indicated, in end of program evaluations, that their approach to school had changed for the better by their experience. 10 of these students were interviewed. In addition one student who did not pass intermediate algebra was also interviewed. The interviews were conducted either in person or by phone. The interviews consisted of questions about what they have accomplished since 2002, how they feel, in retrospect, about the math academy experience, and whether they continued to practice study skills learned in the math academy after 2002. In addition, in each interview interesting issues raised by the former students were pursued in order to

fully explore their point of view. All italicized quotes that follow are from these interviews. In the quotes there are occasionally words inserted to clarify the context. These insertions are indicated by brackets. Note that this sample is clearly not random. Those with more stable personal situations are more easily found and probably more likely to be successful.

### Background:

In 2000 and 2001, after several years experience with a phenomenally successful summer bridge learning community program, a few instructors and counselors began to discuss how they might duplicate some of that success in a program offered during the regular semester. Out of these discussions the math academy was born. In the program students took both beginning and intermediate algebra in one semester. They also took a "community class" which was team taught by counselors and a math instructor. In the community class, students worked on general study skills, discipline specific study techniques, motivation, goal setting, and team building. They also participated in field trips to explore connections between math and other disciplines and to visit transfer institutions.

The math academy also integrated learner support in the form of supplemental instructors and peer advisors as well as the counselors who were assigned a class each as their case load. Math faculty, counseling faculty, supplemental instructors and peer advisors all worked together to reinforce the messages being sent about how to be an effective student. One of the skills most emphasized was the value of participating in study groups.

The program was very successful. In the first semester, in spring 2002, the success rates for beginning and intermediate algebra were 72.0% and 62.3% respectively. This compares to a control group that had success rates of 40.2% and 39.7% in the same classes. In addition to higher success rates student felt better about the program as well. In data gathered at the time by the author, over 50% of math academy students rated the experience as very positive, and over 30% rated it as somewhat positive. This compared to 13% and 19% who had rated their previous math experiences very positive or somewhat positive.

At the time most students seemed to recognize and enjoy the sense of community that the program was attempting to foster. While having lunch during a field trip to Harvey Mudd College, a student remarked, with a smile, "when I left the final of my last math class, I didn't know the name of a single other person in the class. Now I know the name of every single other person in this class."

### Success in later math classes:

The data tends to support the conclusion that the math academy made a difference in subsequent math classes. Among all math academy students, including those who didn't pass, 62.7% had successfully completed intermediate algebra at Mt. SAC by spring 2004. The figure for the control group was 44.4%. Among math academy students who passed both classes in the academy and who enrolled in statistics, 41.4% passed on the first attempt and 69.0% passed eventually. For the control group the figures were 41.2% and 76.5%. Among math academy students who passed both classes in the academy and who enrolled in college algebra, 58.3% passed on the first attempt and 75.0% passed eventually. The figures for the control group were 18.2% and 27.3%. It should be noted that the sample sizes are relatively small, so these numbers should be taken with a grain of salt.

### Academic success:

We can attempt to measure general success in college by looking at the rates of degree completion and transfer. For math academy students, 20.0% had been awarded a degree or certificate at Mt. SAC by the end of spring 2007. The figure for the control group was 17.5%. It should be noted again that these are small samples. Also it should be noted that a degree is not needed to transfer so many successful students are never awarded a degree including at least two of those interviewed for this paper.

53.4% of former math academy students transferred to a four year institution by spring 2007 (32 to the Cal. State system and 2 to Azusa Pacific). For the control group the figure was 41.3% (45 to the Cal State system and 7 to University of Phoenix).

The example of Sylvia, interviewed for this paper, illustrates the limitations of these statistics. She is clearly a successful former math academy student, but because of the long waiting period for the nursing program at Mt. SAC she went to Citrus College instead. So although she is now working as a nurse and credits the math academy as a pivotal experience in her education, she is not counted as a success in either of the above statistics. There is also a question about the

completeness of these data bases. During his interview Johnny stated that he transferred to UCSD, yet that transfer does not show up in the transfer statistics.

#### Changing Attitudes:

A number of those interviewed indicated that attitudes towards school, their own abilities, or their goals changed during the math academy. In particular themes that came up frequently were a willingness to work harder, an understanding of the importance of hard work, taking school more seriously, and having more self confidence.

*"It was like I woke up, I think. Prior to [the math academy] I was just going through the motions... kind of just making it through and not pushing myself. I think [the program] made me realize how much I could do... Once I realized I could do that, it just opened up my sight to school in general because I didn't have that ambition. Or I had the ambition, but I didn't know how much I could really do. I underestimated myself over and over and over again. I didn't think I could do it. And then once I did it, I was just like that was really simple I should have done that a long time ago." Isela*

*"I was kind of wishy washy with going back to school. There was a lot going on in my life... I kept putting school off. I had done a little bit here and there, and then when it came time to do my math classes [in the math academy], I was like ok this is serious business now I need to really buckle down and do this." "Math was also a difficult subject for me and getting through it, that was a major accomplishment." "I think that [the math academy] really boosted my confidence." Sylvia*

*"I wanted to go into teaching, but the math was what was holding me up... I had a really bad experience [in algebra] with my teacher at the time and actually ended up failing the class. At that point I didn't really have a lot of confidence with my math skills... The math academy, I think, was one of the biggest steps toward me actually realizing that math isn't one of those things...that you either get or you don't get. It's kind of like learning a new language. You have to have a strong foundation in the intermediate skills and the lower skills in order to build upon that to understand the higher concepts in math. That was something that I'd always lacked and I think I was afraid*

*before and a little embarrassed that I lacked some of those skills."*

Elena

*"[During the math academy] I didn't mind going that extra step and staying after school...even for 2 or 3 hours...when before I was just trying to like get out of campus." Nadine*

*"It was eye opening for me...I thought it was going to be no problem...and it was challenging. It was a challenge that I met and I was proud of myself for that." Rachel*

*"[Before the math academy I was] not serious at all...What she told me that changed literally how I was as a person was that if I look at everything like it's negative, then I'm going to get a negative result... I started writing like almost affirmations before class...I think really staying positive...was a big thing." Rose*

#### Changing Habits:

Interviewees were asked if they had continued to practice the study skills learned in the math academy after the program was over. In

particular they were asked about study groups. Not everyone did continue to use these techniques, but there was an almost perfect correlation between the degree of success each individual has achieved and the degree to which they have continued to utilize study groups and other study skills.

*"That's where it [study groups] started. I hadn't done that before [the math academy]. I hadn't studied with anybody before like that. Once I got used to it and knew how to do it and what do, I started using [study groups] all the time." Isela*

*"I did [do study groups] definitely, especially through nursing school and with the science classes. And it really makes a difference."*  
Sylvia

*"The idea of learning by teaching...by being in study groups and doing that type of stuff it helps me understand that when you teach somebody something it really helps enforce it in your head and makes you understand it better. The same goes for other classes I've had where I was in study groups." Elena*

*"I didn't put enough effort on the second part - you know the tutoring was there. All the structure was there for me to be successful in the math academy, but I guess I didn't put enough effort to pass...In certain courses where I had issues I would notice who was doing well and I would make an effort to get to know that person, and meet up... to talk about our homework." Carlos*

*"I formed study groups in classes after [the math academy] as well. It really depended on the classes that we were taking...The study groups is actually a helpful...tool." "It did carry through to the UC program. I wasn't lazy anymore. I didn't cram. I followed the course material as it was being presented...I studied every night to try to improve my grade." Johnny*

*"I have [continued with study groups]. Particularly in my physics class...I think it's like really, really helpful." Joy*

*"[Study groups] helped me in graduate school. That's where I used it more." Nadine*

*"I use [collaboration] in my class room now as a teacher. It's really important...I made contact with someone in all my classes...At Fullerton I practiced what you guys taught us." Rachel*

*"I did [continue to use the study techniques] ...I would make myself study a couple times during the week and not just when my class came about...Staying organized and put time into it. I started all kinds of study groups at the psych. Tech. program... You learn when you teach."  
"[The others in my study groups] all passed too." Rose*

*"I utilized study groups throughout my college career." Zulma*

#### Changing Lives:

Every one of the interviewees called the math academy a good or great program. Most remembered it as one of the best experiences they'd had as an undergraduate. A few of the former math academy students credited the math academy with playing a pivotal role in their academic career and even their lives.

*"Overall it was a very wonderful experience...It was very enlightening for me...I honestly believe that because of [the math academy] I was able to graduate from Mt. SAC and transfer." Zulma*

*"I wouldn't want to know [what I would have done with out the math academy]. The only reason I say that is because it set me up. It set me up for my future classes to do well or to want to do well. Not just take them and roll with the motions because that's what I was doing. I was taking my classes and just hoping for a C. I think the math academy made me expect an A." Isela*

*"At that point [in the math academy] was when I really set my mind to finish school. I was determined. I said 'I'm gonna do this'." "It really gave me the kick in the butt I needed to really get going and not be so negative about school." Sylvia*

*"Even today I still talk to people about [the math academy]... I was a writing tutor for a year last year and I actually use very much the story of my problems with math and kind of compare it to a lot of students' problems with English." "Although I might not be the best at*

*math...I definitely have an appreciation for it and a respect for it, and I don't think I would have gotten that with out the math academy." Elena*

*"I'm currently enrolled [in graduate school] at Claremont, of all places...It was kind of surreal for me. I remember when you took us on that field trip [to Harvey Mudd College], I thought that was a school that was so out of reach for me. I thought 'I would never go to a school like this'." Rachel*

High expectations:

Several interviewees spoke about the high expectations of the program and how that had an impact on their own level of seriousness and, after seeing success, their confidence.

*"It set a tone to say this is what we expect - no less, and so I think people kind of had to step up and do it." Isela*

*"I used to think you were so hard - not hard, but you had expectations and that was a good thing. Now I'm on the other side [a teacher now] and I have expectations of my students...I used to think*

*how hard it was and that was just a taste of how difficult - not difficult but challenging school was for me. Rachel*

Community:

Many of the former students remembered fondly the sense of community that they felt in the math academy. A number of them kept in touch with each other long after the program ended. Two of them even asked for contact information, so they could reconnect with friends. (Do to privacy concerns regarding college records, this was not provided.)

*"Everybody in the class was aware of what you got and they were so interested because we were a community." "I loved it when we would study together and they would say 'I don't understand this' and you could explain it to them." Isela*

*"The whole group thing and working together just makes a difference when you're learning. You don't feel you're just learning this on your own." Sylvia*

*"Another thing about the math academy that I really took away from it is just how important it is to build bonds with other students in your classes." Elena*

*"The class was actually fun in that we all sort of bonded together in trying to complete that math course... It was pretty fun. It was a good environment we studied at school and we also studied outside of our class time." Johnny*

*"I think it was great. I thought it was really good. Just getting together with - seeing the same people everyday and working with them." Joy*

#### Support:

In addition to the connections made between students, interviewees also spoke of the connections they felt with faculty and staff. Many of them mentioned by name people who were especially helpful. In particular they spoke of going back to counselors for help and advice long after they had finished the math academy.

*"I had never spoken to my counselor prior to [the math academy], and then I started speaking to him almost on a biweekly basis." Isela*

*"The way you guys put the academy together, it's very non-intimidating. It's very comfortable... You just feel like you're going to be successful. Sylvia*

*"The class gave me the kind of structure and the support to be able to take time and really understand that when you practice math and when you really spend a lot of time with it that's really one of the ways that you really learn how to be good at it." Elena*

*"The counselor really helped me." Nadine*

*"I think I was an average student. I think I could have done better in school than what I did. I don't think I was supported a lot...at school and at home." "Many times I have reflected back on the math academy days...because I think you guys were very supportive...I enjoyed being in the math academy." Rachel*

*"Before I started the math academy...I feel my experience was kind of like accidental, because I did not have the guidance before... Just the whole program overall gave me a lot of guidance. I'm very thankful for everything that I basically went through in the math academy." Zulma*

Individual stories:

**Isela:** After graduating from high school in 1996, Isela attended Mt. SAC off and on for 6 years, but in that time still had not completed beginning algebra. After successfully completing the math academy, in 2002, she completed her two year degree, transferred, and graduated from Cal. Poly. Pomona all within three years. She has been teaching third grade and kindergarten.

**Sylvia:** Originally Sylvia had wanted to go into nursing, but didn't think she could get through the science and math classes. She had settled on the idea of teaching, but after her success in the math academy she decided to give the science classes a try. After completing the requirements, she was accepted to the Mt. SAC nursing program, but with a two year wait. She enrolled in the nursing program at

another community college, and is now working as a nurse. She is considering returning to school to complete a 4 year nursing degree.

**Carlos:** Carlos did not pass the second class in the math academy he eventually completed a two year degree at Rio Hondo College, and is currently starting a business administration program.

**Elena:** Math was a problem area for Elena. After succeeding in the math academy, she went on to transfer, earn her four degree, and enroll in graduate school. She is currently finishing her master's degree in English and this semester is teaching her first class. She wants to teach, write, and eventually earn her PhD.

**Johnny:** After success in the math academy, Johnny transferred to UCSD where he graduated with a double major in ethnic studies and visual arts. He currently works for a travel consulting firm.

**Joy:** After the math academy, Joy left school for a while due to "personal situations" in her life. She is back in school now and taking math 280 at Mt. SAC. She plans to transfer soon to Cal. Poly. Pomona

in engineering. She credits the Harvey Mudd College field trip during the math academy with helping her to decide on engineering as a goal.

**Nadine:** After her success in the math academy Nadine transferred, got her bachelor's degree, got a master's degree in counseling, and is now a high school guidance counselor.

**Rachel:** After succeeding in the math academy, Rachel transferred to Cal. State Fullerton and graduated with her bachelors. She worked as a substitute teacher for 3 years. She is currently enrolled in graduate school in a credential and master's program.

**Rose:** After the math academy, Rose earned an AA, an AS and completed the Pysch. Tech. certificate program at Mt. SAC, and is currently working for a nonprofit in that field. She plans on returning to school at some point to get a nursing degree.

**Vanessa:** After the math academy, Vanessa transferred to Rio Hondo College and has now transferred to Cal. State LA.

**Zulma:** After the math academy, Zulma transferred to Cal. Poly. Pomona where she earned a degree in sociology. She is currently teaching and working on her credential.

Conclusion:

Participation in the math academy in spring 2002 is associated with higher rates of degree completion and transfer. Among the students that were interviewed, those who took the lessons of the math academy to heart have all been successful. Many see the math academy as an important milestone in the academic career, and some even credit the math academy with changing their life. It is clear that it is possible, with the right structures, to have a huge impact in the lives of students, even in the context of a class (algebra) that is often seen as something that students just have to get through. A number of interviewees expressed the opinion that this type of program should be offered to more students, and the author agrees.

## **Addendum to Sabbatical Application** **by Matt Munro**

At the request of the Sabbatical and Leaves Committee, the following provides more information on the research part of my sabbatical leave proposal.

**Goals:** Many students who have participated in the Math Academy/Math Bridge program have described the experience as transformative. They say their approach to school has changed, they have a stronger belief in their own abilities, and they are more motivated to achieve their long term goals. I would like to discover how those feelings have stood up over time. The first participants have had 5 years to achieve those goals (or not). How do they feel, with hind sight, about the Math Academy experience? Was their approach to school really transformed? Or did they slip back into old patterns? Have they achieved their goals? If not, why? If so, do they credit their experience in the Math Academy as having a part? In other words, did the math academy just make them feel good about school in the short term or did it have a lasting impact?

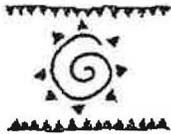
**Methodology:** I would like to conduct person to person interviews with former Math Academy students from the first year of the program. There were about 60 of them. Of those, about 80% rated the Math Academy as a positive or very positive experience. About 25-30% described the program as having a transformative effect on their academic lives. Some students will be impossible to track down, others may not want to be bothered with an interview, but I hope to be able to interview 15 to 20 of the students who had the best experiences in the Math Academy.

I will tape the interviews, transcribe them, and summarize the information gained as part of a larger report on the efficacy of the Math Academy/Math Bridge program. This larger report will make use of data developed by the college research office and myself this spring and next fall, and will be useful to the college community as a whole in ongoing discussions about expanding and improving our learning communities programs.

Date: January 4, 2007  
To: Linda Potter  
From: Ginny Burley  
Re: Notes on Sabbatical Leave Consultations

1. Cynthia Prochaska: Cynthia strongly wants a full year, so I asked that she concentrate on the product aspect, making it more clear just what she is going to show as results. I also asked her to reconstruct timelines so that she does not include winter intersession. I am not convinced given some of the other sabbatical projects that if she does significant reading in this field and can create a resource that might be used by other faculty members that this project is too light for a full year. We have a lot of disabled students, and it appears that she is doing some work in an emerging discipline even though she is not taking courses. Let's see.
2. Matt Munro has not contacted me. Was I supposed to call him? The others did contact me.
3. Terri Beam: I talked with her at some length after John's conversation with her. She definitely wants a full year, and she is willing to rewrite the project. I encouraged her to focus on the creation of "learning modules" that can be used in various Chemistry classes. I have a rewritten draft in my mailbox as I return. As a related issue, both Larry and Debbie have talked to me questioning the project. Larry believes it does not have the level of intellectual rigor that other sabbatical leave projects have demonstrated; Debbie is concerned about the department not supporting learning modules that she creates. I am forwarding both of them her rewritten draft, and I indicated to them that if they do not support the project they need to say so. However, the decision to grant a sabbatical is up to the Sabbatical Leaves Committee and not the department or division office, although both must give their feedback.

1/7/07 Left message on matt's voice mail



Linda  
Potter/InstructionOffice/MtSA  
C

12/18/2006 09:49 AM

To Matthew  
Munro/Mathematics/NaturalSciencesDiv/MtSAC@MtSAC

cc

bcc

Subject sabbatical proposal

Please see the attached correspondence regarding your sabbatical proposal.



Munro response.doc

Linda Potter  
Executive Assistant - Vice President of Instruction  
Mt. San Antonio College  
909.594.5611 ext. 5414

# Mt. San Antonio College Salary and Leaves Committee

John Nixon, Chair  
Ginny Burley  
Ralph Eastman

Stephen Runnebohm  
John Vitullo  
Emily Woolelry

Date: December 15, 2006

To: Matt Munro

From: Salary and Leaves Committee

Re: Evaluation of Sabbatical Application

We have completed our evaluation of your sabbatical application for the 2007-08 academic year. We have several questions and would like you to contact Ginny Burley (ext. 5495) to discuss them.

C: Committee Members  
lp