Life After Davis

Submitted by Laura Loos (B.S. '96)

When I came to Davis, I chose mathematics as my major because it was the most challenging class I experienced in high school. It was not a particularly misguided reason to choose a major, and probably more successful than tossing a dart. I continued for the first year out of sheer momentum. The Emerging Scholars Program (a calculus lab run in conjunction with the first year series) opened up the world that would fascinate me enough to stay for three more years.

The reasons I stayed with mathematics changed by class, by professor, by moment, but always included the beauty, the logic, the safety, the lack of boundaries, and the challenge. I never knew if it was mathematics that I loved or these attributes. The mathematics I learned and the learning processes used as I explored this world are inextricably linked in my appreciation of my education.

I chose to dive into the professional work world out of college rather than continuing with my mathematics education out of necessity to prove to myself I could survive outside of academia. I joined a consulting firm whose expertise is in implementing large scale business systems. My response to "What do you do for a living?" takes fifteen minutes on a good day, when I am sure of what I do. Consulting challenged me in a different way than mathematics. It included the challenges of people, of uncertainty, of change, and of the illogical.

My day to day activities have not included a single integral or even required me to recall a single theorem. However, more than once, I have been able to correct a business decision by recognizing an individual was reversing the implication of a statement. The skills I received from my mathematics education at Davis have allowed me to critically analyze system architectures, business decisions, implications of system design changes, and identify the root causes of system errors. They are all puzzles to solve, proofs to follow to their logical conclusion. I am still in love with the world to which Davis introduced me and remember my undergraduate years as some of the best ones of my life.

Dear Dr. Kouba,

Please share this with the ESP review board:

Of all of my memories of the five years I spent at UC Davis, my fondest are those associated with the Emerging Scholars Program. ESP was a wonderful experience in several ways. As a freshman, participation in the program gave me a solid fundamental understanding of first year calculus. This was invaluable as I continued with the second year of mathematics. It also helped immensely with my science and engineering classes which all relied heavily on calculus.

I was a part of the first ESP class. Many of us in the class chose ESP over the honors calculus class that was offered. Because of the unique methods and intensive exposure to calculus in ways that the non-ESP students were not, our class was able to outperform the honors classes.

The ESP lab was set up in a small group format. This format taught us how to work in groups and utilize each of our strengths. Because the groups were assigned, it also ensured that we got to know everyone in the class and learn how to work with each individual. Because of the lab component. as ESP students we were able to cover material at a more in-depth level than that offered in the weekly lectures and recitation sections.

After completing the second year of mathematics, I had the privilege of working as a TA in the ESP lab for my last three years at Davis,. This was an incredible experience. Not only was my own understanding of first year calculus strengthened by working with the ESP students, but in working with them I was able to experience the teaching aspect. I have used that teaching experience and mathematical knowledge in the courses that I taught in graduate school. I also use a portion of the fundamentals from ESP in a course that I teach for high school students participating in the STEP (Science Training Encouragement Program) at 3M.

Several times during my final year at Davis and on subsequent returns to campus. I have had students come up to me and tell me that they participated in ESP. They always continued on to say that the program really helped them during their time at Davis and that they were really glad that they had a chance to participate in the program. And to my knowledge, ESP has spawned at least one marriage.

ESP teaches students the fundamentals of first year calculus. It teaches how to think about challenging problems, how to look at problems creatively, how to work in groups. In my eyes, ESP is definitely one of the highlights of the UC Davis Department of Mathematics.

Sincerely,

Deborah Isabelle
Advanced Product Developer
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April 6, 2002
9450 Gilman Dr.
UCSD #922551
La Jolla, CA 92092

To whom it may concern:

SUBJECT: ESP Assessment

I believe the Emerging Scholars Program is a major asset to UC Davis. As an undergraduate I was involved in ESP both my Freshman year as a student in the program, and then my Senior year as a TA. Being a student in the program helped my in several ways. First, it forced me to work on mathematics "outside the classroom" for 5 hours a week, thereby creating good study habits. When exams came around I didn't have to "cram," I already naturally knew the material, having become very familiar with it in ESP. Next, the program allowed me to become more comfortable discussing math--with professors, TAs, and my fellow students! Finally, ESP made me more excited about mathematics. The ESP worksheets contained some interesting harder problems that one might not usually come across in calculus. This helped to dismiss the notion that doing mathematics is completely "mechanical"--a notion that seems to be prevalent among lower-division undergrads and perhaps is misleading considering the direction upper-division math takes.

Originally a Computer Science major, I switched to Mathematics during my Sophomore year. This was due to my continuing enjoyment of my math classes, an enjoyment that got off on good footing with ESP. So in the Spring of my Junior year, when I heard that ESP was looking for TAs for the next year, I jumped at the idea. The hiring of undergraduates to TA ESP is a good move as it provides a good transition for students such as myself who go on to graduate school. Being an ESP TA was a good introduction to TAing for me, as it provided a low-pressure environment where I became comfortable with working with students, giving hints, and providing encouragement.

Thus ESP works on several levels, always encouraging further mathematical interest and providing the transition toward such study. I believe more universities should institute such programs, and UC Davis should keep up the good work!

Sincerely,
Caleb Emmons

Date: Wed, 27 Jun 2001 14:55:58 -0700 (PDT)
From: Jennifer Cordial <jlcordial@ucdavis.edu>
To: kouba@math.ucdavis.edu
Subject: Thanks

Dr. Kouba,

Thank you for the opportunity to work with the ESP program as both a student and TA. I actually think I learned more as a TA, but if it weren't for the ESP program I would never have even considered math as a major. I remember sitting 21B thinking I only had one more quarter of math left ever...if I only knew then.

Thanks for all your help.

Jen

Long Beach Unified School District

DAVID STARR JORDAN HIGH SCHOOL

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February 18, 2002

Dr. D. A. Kouba
Emerging Scholars Program, Coordinator
Department of Mathematics
University of California, Davis
Davis, CA 95616

Dear Dr. Kouba:

I need your help! But, before I explain just what kind of help I need, I would like to thank you for the many ways you have influenced my life (If you would like to skip the following update of my life, it is long, go straight to paragraph eight). Through the Emerging Scholars Program (ESP), you introduced me to academic rigor, problem solving, and teamwork in mathematics. By participation in the ESP, I also learned to seek out (or give) as much information as possible when attempting to achieve success in mathematics, or any other endeavor.

The lessons learned from the ESP program translated into success in my upper division courses, albeit progressive (e.g. math 127A grade-C, 127B grade-B, 127C grade-A-). This in turn, led to an opportunity to serve as an undergraduate assistant for the 1993 ESP class, and more importantly a Bachelor of Science in mathematics.

The enthusiasm for teaching kindle by my duties as an undergraduate assistant inspired me to apply and attain a teaching position in the International Baccalaureate (IB) program at my high school alma mater, David Starr Jordan High School (Long Beach). The IB is a rigorous academic program in which students prepare to take six tests, in six different subjects -math, social studies, English, science, language, and the arts- in order to receive an IB diploma in conjunction with the normal high school diploma. The courses offered under each subject are either Higher Level (HL) or Standard Level (SL) (sort of like 21A and 127A, but for high school). Most of the HL courses, and some of the SL courses are worth college credits (pending students can pass each test with the required score). At least two of the six courses should be HL, and, along with these six courses, students must complete an extended essay (within 4000 words), take the Theory of Knowledge course (one semester), and complete Creativity, Action, and Service hours (at least 150).

When I arrived at my alma mater, the IB program was inchoate. The program was also being vilified, and deemed by some as a complete failure. But in order for students to meet the requirements described in the previous paragraph, some changes had to be made. One important change was to allow freshmen to take courses traditionally taken their senior year. Dr. Shickler, the administrator in charge of the IB program, instituted this vital change. Next, it was necessary to increase the variety of classes offered for each topic, and this is the area I was able to assist this nascent IB program.

Math Methods, a course equivalent to AP Calculus, was the only IB math course offered when I began teaching at Jordan. Moreover, there was a need for a course that was rigorous, but also accessible to

students who were going to pursue majors that require little or no math. I received training, and established the Math Studies course (syllabus included), which I taught for three years. Also, I established the Creativity, Action, and Service coordinator position, which I held for one year. Other courses added to the IB program via my dedicated colleagues are Business and Organization SL (Social Science), Psychology SL (Social Science) and Physics HL (Science).

The results of these efforts, at first glance, would appear meager. In the four years it has taken to complete the I. B. program, we have had eight IB diploma recipients. However, this is a distinct improvement on what had been achieved the first seven years of the program (zero diploma recipients). Moreover, during the six years I have taught in the I. B. program, we have helped many students get accepted to excellent universities and colleges. A variety of U. C. system schools[♦] (Davis included), Stanford, U. S. C. and Rutgers make up a short list of the colleges and universities our inner city, low income students are attending. Amazingly, we were able to do this while building our IB program! Now that all the components are in place, the number of I. B. Diploma recipients can only rise. In fact, it is already rising if we consider that in 1999 we had one diploma graduate, by 2001 we had seven. This represents a 600% increase!

My experience with the ESP gave me the confidence and preparation needed to effect positive change, and contributed to my community and alma mater. The accomplishments describe in the two previous paragraphs would be reward enough, as they represent the realization of important personal goals. But in addition the these accomplishments, I have also received a few accolades for my work at Jordan High, here is a list:

- Jordan High School Homecoming Honor Graduate (1997)
- Disney American Teacher Award Nominee (1999)
- Who's Who Among American Teachers (2000)
- New Teacher Coach for the Long Beach Unified School District's New Teacher Project (1998-2001)

Now that we have taken a look at the events that have transpired over the last seven years, let us turn to the initial purpose of this letter –the need of your assistance. Despite the fact that teaching at my alma mater has been very rewarding, I am convinced that now is the right time to pursue a Master of Science in mathematics. And it is in this endeavor that your wisdom and assistance is once again needed. Enclosed, you will find in a large envelope the following:

1. A previous letter of recommendation.
2. Two small envelopes with a form, or a post-it to indicate the letter's destination.

To save time I recommend that you transcribe the previous letter of recommendation (why change a good thing anyway). I would just ask that you revise the dates and include the class rankings in the new letters. After sealing each letter inside the small envelope, please SIGN the back and place them in the large envelope. I will pick everything up by February 26, 2002. I hope this is enough time, if not, please give me call or send an e mail (this information is listed below).

[♦] We sent nine to U. C. L. A. last year alone.

In addition to the lesson learned from the ESP, there is one other way you influenced my life. Recalling the dedication to fitness you displayed daily by playing basketball in the Rec Hall, I too go to the gym daily for at least an hour. No basketball, I prefer the Stairmaster, but I still play occasionally. Dr. Kouba, you embody the ideal of a healthy body and a healthy mind, and I admire your exemplary example.

With all respect, I wish to thank you for what you have contributed to my life.

Sincerely,

Charles N. Morris III
Mathematics Teacher

335 EAST CUMMINGS LANE o LONG BEACH, CA o 90805
PHONE: (562) 626-8024oE MAIL: MODOUG7@HOTMAIL.COM

Date: Tue, 2 Apr 2002 13:25:11 -0800 (PST)
From: Sara Deleon <sdeleon@ucdavis.edu>
To: Duane Kouba <dakouba@ucdavis.edu>
Subject: Re: ESP

Dr. Kouba,

The best thing ESP did for me was give me confidence in my mathematical abilities. Since I didn't need the 21 series for my major, taking the 21 series was strictly voluntary on my part because I liked math. I took the 21 series because I liked math so much I didn't want to have to stop because I didn't have the right prerequisites, if I wanted to continue. It turns out I did want to continue, and not only did the 21 series allow that, ESP did also. Because of the numerous problems we did in ESP, I became confident in that not only did I know how to do the problem, but I understood it as well. This confidence came from a lot of hard work during my freshman year, but it payed off greatly.

I liked ESP because it gave me a chance to talk to other students about mathematical concepts, which strengthened my understanding also. ESP also gave me a chance to actually work on problems, to actively learn and not just read the text or something like that. I think that it helped install good study skills that will and have lasted throughout my schooling.

James Parmenter

Emerging Scholars Program 4/12/02

When I entered U.C. Davis as a freshman student, hoping to major in Aeronautical Science and Engineering, I was placed into the Emerging Scholars Program (E.S.P.) so that I would have the opportunity to develop my calculus skills a greater level that most other freshman. I found that being in E.S.P. gave me a much stronger foundation in calculus than I would have had without it. I had 5 hours a week that I was assuredly going to spend working on math problems that were usually more challenging than any of my homework problems. I had access to 4 undergraduate students and one graduate student who were all well versed in calculus and were able to provide help both during E.S.P. class times as well as during office hours outside of class. Finally as a student I also had the privilege of having Dr. Kouba teach me calculus in a setting with far fewer students than a regular class. Dr. Kouba is one of the best math lecturers at U.C. Davis and to get so much personal attention from him was another benefit of the class that I greatly appreciated.

As an undergraduate assistant for E.S.P. for the last 2 years I have gotten to see the positive impact myself and the class in general can make on students understanding and synthesizing of calculus. I have heard many students state that for one reason or another if were not for E.S.P, their math class might have proven too difficult for them. Also, being an assistant in the class has given me the opportunity to gain experience in an area I hope to pursue. I hope to be a math professor some day, and working with students in this manner is something I will have to do, so I am grateful that I am acquiring experience now that will help prepare me for my future career goals. E.S.P. is a fun class, students and student assistants get to interact with each other and help each other learn. It really is a place where learning happens while people are enjoying what they are doing.

Date: Sat, 13 Apr 2002 15:30:44 -0700 (PDT)
From: tptlam@ucdavis.edu
To: dakouba@ucdavis.edu
Subject: ESP Letter

Dr. Kouba,

ESP aids the development of two vital skills for first year students: working in groups and working above minimum requirements. On the first day, Dr. Kouba recommended first seeking our peers as a resource for problem solving. Taking this to heart, my peers and I acknowledged each other as resources and learned from it. We gained confidence and clarity from presenting solutions to chalkboard demonstation problems. During problem solving workshops we aided each other in a fair exchange of information. We asked each other if our explanations were understood; respect and insight were the most rewarding gifts from this cooperation.

In ESP we worked on problems outside of the calculus lectures and assignments. The extra time in ESP allowed us to recover material lost from shortened or hurried lectures. Without the Emerging Scholars Program, I would not have developed good outside-of-class learing skills. I may have worked no more than a minimal ammount. I am certain ESP shaped my study skills; I could have missed strengthening these skills as a freshmen, and I know I would be less successful today.

- Tony p Lam
- tptlam@ucdavis.edu

Carlton Kong

Math 21A

Dr. Kouba

3 December 2001

Autobiography of an ESP Student

Although I have been here at UC Davis for only a short time, it feels as if I have been here for ages. It seems that I have forgotten what my own bed at home feels like. The faces of those people that I have called "friends" in the past seem like shadowy figures to me right now. When I look outside of the window, I do not see the sky that I used to see when I was at home. All I see is this odd canopy that looks like the sky that I used to know. But there are still some constants in my life: making new friends that help fill the void that I feel for the old; lying in my bunk bed that seems way too small for me but makes me feel happy when I sleep. And the monstrous constant of them all: school.

The jump from high school to college has been extremely hard for me. My study habits, which are poor in the first place, seem completely inadequate to handle college work. The way I seem to lurch around campus, trying to get from one class to another, making sure that some random bicyclist that is trying to get across campus does not kill me. That has never been a problem when it comes to walking across a high school campus. My roommates and suitemates are slowly turning my life upside-down and inside-out. Most of the time I am able to co-exist with them, but there are a few occasions where they have not been so hospitable to my needs. I have been trying to focus on my studies, but it is pretty difficult. Then there is that shyness that never seems to go away from me. That shyness that keeps me from asking questions about a topic that may be as simple as "what does alliteration mean?" or "why does my program keep

telling me that I have a segmentation fault when I run it?" It feels as if asking these questions will eventually lead to the end of me. Even my calculus class seems to reek of this feeling.

But then I get to my ESP class, and all of that seems to disappear. The ESP class is basically a group of people who are given the opportunity to work together on a variety of calculus problems. Even though it is so early in the morning (when you get very little sleep at night, 8 o'clock in the morning is early), I feel that I want to go to that class. I look around my ESP class and see the same people day-in and day-out. There is something satisfying about that sight. I have no idea why I feel this way. Then I sit down and actually begin to do the work that I have to do. I do my work, working at a pretty steady pace. Then I come to a problem that I cannot do. I sit there and look puzzled for a few moments. My mind begins to go through the motions that it usually does when it comes to figuring out a problem. I think in the back of my mind that all the people here are a lot smarter than I am. Asking such a question would make me seem stupid, perhaps even foolish. I have always been a bit too over-sensitive about comments like that. So I get up the nerve (which for some reason takes a long time) and ask the question. There are occasions where they clearly explain how to do a problem with great ease. Sometimes, I find that there are those who have the same questions that I do. They are stumped and we cannot seem to figure out how to solve the problem. We try to get things going and we might be able to figure out something in the process. But then there are those pesky problems that we cannot seem to solve. We then turn to the TA's and the professor to help us.

Even though calculus is interesting, it is not something once can do all the time. That is why there is the ever-popular downtime. Downtime is when everyone just begins to talk, listen, and unwind after solving some difficult calculus problems. This usually occurs toward the end of class, but there have been a few occasions where we just begin to talk from the beginning to

the end of class time. As I talk with these people and learn about them, it just seems interesting to hear each of their stories, whether it would be about their past or their current situation as a freshman college student. I have met people that have lived in the Bay Area and have given me some insight on how living there is quite different from living in Davis. Since I am originally from Southern California, I never really understood the difference between the Bay Area the Sacramento area. I had assumed that the two were in the relatively the same area. The people there have set me straight in regards to those differences. Then there are those that are in the same classes or live in the same area that I am in but I have never seen these people before. It is always a bit of a shock to put a name to some anonymous face. Then there are those that are from parts so far away that it is surprising to even believe that they are even in California. If I recall correctly, I have met someone who was originally from Louisiana. Then there are those who have interesting stories to tell. One classmate that I have gotten to know has treated Istanbul as his home. He has had the privilege to fly back and forth there to visit family there. There was even someone who had asked me for advice about things outside of the classroom. One person that I have talked to asked about my schedule since she was interested in getting into the same major that I was in.

Then I realize something: this one class has brought all these people together. I think about that fact in my mind and I chuckle at it for a little bit. It astonishes me sometimes to think that people want to sit in a relatively cramped room and try to work on calculus problems. Five different people forced to figure out the cylinder with the largest possible volume that can fit within a sphere of a particular radius. In the broader sense, I think that math has brought all of us together.

Dr. Kouba,

I am writing to you to you to tell you what a rewarding experience it has been to TA for ESP Calculus. The students were amongst the most motivated, hard-working individuals of any class that I have ever assisted in, and each of them deserves the high marks that they will undoubtedly receive. Students of this high caliber are, I believe, very rare and very special.

And In spite of the fact that the class met at 8 am, TAing for ESP was something I looked foward to with great enthusiasm and was the highlight of my day; my only regret is that I will no longer be able to take part in the program.

Good luck with next year's class.

Mas Kimura

Dear colleague:

I am writing to express my high opinion of the Emerging Scholars' Program (ESP) in the UC Davis Mathematics Department. I was a graduate student lab supervisor for the program during the Winter 2000 quarter.

I believe the ESP program is an extremely valuable tool for mathematics and science majors at UC Davis for the following reasons. First, students in the ESP program have access to five additional hours of intensive group study in addition to the regular course lectures. The group atmosphere of this study time fosters collaboration among the students that will not take place in large lecture environments. Second, the additional time spent in ESP allows the applications of calculus to science and engineering to be heavily emphasized. This is in contrast to the the computational skills emphasized in the course lectures due to the limited amount of time. Finally, ESP students have the opportunity experience mathematics at a creative and social level, rather than merely attending lectures, turning in assignments and taking examinations. This creative involvement is crucial in stimulating student's interest in mathematics and its applications.

I have seen the positive results of the ESP program first hand. Specifically, I have worked extensively with James Parmenter, an ESP student who went on to be an ESP undergraduate assistant as well as successful mathematics major. Mr. Parmenter was my student in MAT 150ABC, as well as in an advanced independent study course. James was a junior for both of these courses, and it is rare for a student at that class level to succeed so completely in advanced courses. I have no doubt that his ESP experience was partially responsible for his success.

Th ESP program is highly successful, and I have witnessed the positive effects of it's success first hand. I strongly encourage the Mathematics department to continue to support the ESP program in the future.

Tyler Evans
Assistant Professor
Department of Mathematics
Humboldt State University

Date: Sun, 7 Apr 2002 17:28:18 -0700 (PDT)
From: Bori Mazzag <borim@math.ucdavis.edu>
To: Duane Kouba <kouba@math.ucdavis.edu>
Subject: Re: ESP

Dear Dr. Kouba,

This is my letter of support for the Emerging Scholars Program (ESP). I worked as an ESP lab supervisor two consecutive Fall quarters, in 1998 and 1999.

Both of these quarters I was very much impressed by the quality of the students that ESP attracted. I had previously worked as a teaching assistant (TA) for calculus classes, therefore I was familiar with the level of preparation and the work ethic of the average calculus student at UC Davis. ESP students on the whole were much more committed to learning the material presented in their calculus lectures, and to even go beyond this, and acquire additional skills. In the ESP lab students work in groups on challenging problems that often go much beyond the scope of the standard calculus material. Most ESP students are very dedicated and eager to learn.

The group of ESP students I taught were very diverse. I believe that ESP helps Freshmen succeed in college partly because of its academic standards, but also because it provides a support system for students. I have often seen ESP students studying and spending time together on campus. I believe that the social network it creates is another very important outcome of ESP, particularly for minority students.

I am very strongly in favor of continued support for the ESP program, because I believe that it is a very valuable asset to the Mathematics Department at UC Davis. Sincerely,

Bori Mazzag

Date: Fri, 29 Mar 2002 20:07:08 -0800 (PST)
From: Brad Ballinger <brad@math.ucdavis.edu>
To: Duane Kouba <kouba@math.ucdavis.edu>
Subject: Re: ESP

Duane,

Why teaching ESP is a rewarding experience for me as an educator:

The students are active and engaged to an extent I have never seen elsewhere. The reason I teach is so that I can see a student's face during that moment of revelation, and in ESP, that moment happens all the time.

The format of the classroom makes optimal use of my time: most routine questions are resolved within the group or with an undergraduate assistant's help, allowing me to focus on difficult or conceptually significant issues.

I learn the names of all my ESP students, whereas I have learned the names of only a few of my non-ESP students. It's much easier to do in ESP, so I feel like I'm helping real live people whenever I'm in the ESP room. Outside ESP, I often feel as though I'm just another piece of the conduit between high school and employment.

I feel challenged by an ESP class. There are usually some students who master concepts quickly, or have previous experience. ESP gives me a rare opportunity with such students: do I show them how the current material relates to something they'll study next year? Do I teach them how to communicate their current knowledge to their peers? There are usually also a few students in the class who struggle to get through. They might need more examples, different pictures, or supplemental exercises. I use my whole brain in ESP.

Why ESP is good for students:

In the regular ten-week 21-series calculus courses, many ideas are introduced for which there isn't enough time to fully develop the underlying intuition. ESP affords interested students additional hours of guided practice. ESP students ask and get asked lots of questions, and they emerge with some genuine understanding of how calculus works. I believe that an ESP student has an almost unfair advantage over the typical student of a traditional lecture-format class. Wouldn't it reflect well on UCD if more of our graduates had this unfair advantage?

Not only do ESP students have a much better chance of learning calculus, they also get to practice useful collaboration. I believe that students in a regular calculus class are likely to attempt the homework, become frustrated, and then copy the answers from someone else--if they don't just start with the last step. But this kind of behavior is rare among ESP students. Instead, I usually find ESP students explaining things to each other and working through problems together. If a group reaches a solution but not everyone understands it, someone will usually ask a question, rather than pronounce the problem dead.

Looking good on paper is not a direct goal of the class. There are easier ways to get 2 P/NP units than signing up for ESP, and ESP scores have no effect on grades in the regular section. Bottom line: students take ESP to get good at calculus. The same can't be said of most calculus classes. The energy in an ESP class is substantially different from that of every other math class we offer to undergraduates, and the result is a very high

Date: Tue, 12 Mar 2002 09:56:52 -0600
From: "Penkava, Michael R." <penkavmr@uwec.edu>
To: Duane Kouba <kouba@math.ucdavis.edu>
Subject: RE: ESP

Dear Duane,

As you know, I am a big supporter of the ESP program, based on my experiences with it. I think it is a model of what affirmative action programs ought to be, which are programs designed to take students who are talented, but whose academic backgrounds are weak, to the level at which they are capable of performing. Here by affirmative action I mean precisely that groups of students are identified by some means as being under trained due to a weak educational background, either because of economic conditions or a combination of weak schools and possibly factors from the home environment. These students are thought to have talent which testing will not reveal because their training is weak. Acceptance of these students into the university is based on their potential, but some remediation of their background training is necessary for them to achieve this potential. The ESP program addresses this remediation by substituting an intensive 5 hour per week hands on laboratory environment, using a variety of cooperative and individual training, for the usual 1 hour per week discussion section. As a result of this training, students develop better algebraic skills, which they are then encouraged to use to develop superior understanding of the course material. A variety of incentives are used, and students are led to expect to have superior performance in the course. Although the purpose of the program is to remediate certain educational weaknesses, the ESP program is not remedial, and the students are aware of the record of past achievement of students from the ESP program. They are taught how to develop mastery, and the record supports the conclusion that students do develop better skills and understanding in this program. The year that I was involved in the program, I was the instructor for the fall ESP class, which had 41 students, and students scored an average of 20 points higher on a 200 point final exam than students as a whole. I also was the instructor in the winter quarter for the large class where all the students from the ESP program were enrolled. The ESP students outperformed the other students again this semester. Finally, I was a lab instructor in the Spring of that year, and I was very impressed with the students willingness to work on very hard problems that I would write on the board and have students come up in pairs to work on when they finished working on the worksheets that they would work on in small groups.

Best to you,
Michael Penkava

Date: Wed, 3 Apr 2002 15:35:11 -0800 (PST)
From: Lawrence Marx <marx@math.ucdavis.edu>
To: Duane Kouba <kouba@math.ucdavis.edu>
Subject: Re: ESP

I have been a lecturer for an ESP class and have also served as an ESP lab instructor, and I feel that ESP is a very valuable program with a proven record of success.

Students in ESP typically learn quite a lot more than other calculus students, for several different reasons:

1) ESP students get much more practice solving problems than the typical student;

2) ESP students are exposed to more challenging problems than most students normally see;

3) Students in ESP get more feedback about their work, since they receive solutions to the problems they work on in the labs, and since they take weekly quizzes;

4) The ESP labs give students ample opportunity to reinforce the ideas presented in the lectures (and to clear up any misconceptions); and

5) ESP students gain a better understanding of the material than many other students, since they continually get a measure of the depth of their understanding when they explain their solutions to each other.

Students who have a sincere desire to learn calculus well can benefit greatly from this program.

Lawrence Marx
Lecturer in Mathematics

PS - (The only thing I would add is that there should be a new ESP coordinator, preferably with the initials JC.)