

12-21-80

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Plus A Little Help

Her Math Plan Adds Up

By Sigrid Bathen
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Ricardo Zaragoza, 17, a senior at Luther Burbank Senior High School, has a trace of a Spanish accent — but only a trace. His family emigrated from Mexico when Ricardo was 11, and his father works in a local cannery. Spanish is spoken at home, and Ricardo says he still has to work at "thinking in English."

Ricardo also works at calculus, in a class taught by a Burbank math teacher who has earned a reputation as a marvel at getting kids interested in advanced math. The teacher, Barbara Warner, is especially adept at interesting girls and ethnic minority students — groups that are badly underrepresented in math and science careers.

Ricardo and his older brother and sister — both former Burbank students and now engineering majors at the University of California in Davis — are cases in point.

So is Sylvia Zachary, 17, who as a child preferred building blocks to dolls and now takes college calculus at California State University, Sacramento, while still a senior at Burbank. Sylvia is the only female and only black student in her university calculus class, where she was enrolled this year through the persistence of her Burbank math teacher, Warner.

Concerned that her best students were being denied advanced mathematics beyond high school calculus, Warner convinced area colleges and universities to accept qualified students for certain classes while the students are still in high school. Another Burbank senior, Derek Koonce, is taking advanced math at Sacramento City College this year.

"At first, no one had heard of advanced placement in this part of the state," Warner said. "I had to go to the colleges and fight to get them into offering classes for students who pass our advanced placement test. In the last two years, the colleges have started advancing the students even further than what the test qualifies them for. One teacher from Sacramento City College called me and asked me to encourage my students to get into his class."

Warner, 37, has been a math teacher at Burbank since she graduated from UC Davis 16 years ago. What to study was a tossup, she said, between math and Latin. She liked the precision of both, but chose the math.

Warner clearly likes kids. Just as clearly, she makes them work hard. Two-thirds of Burbank's student body is black or Hispanic. The school has been plagued by declining enrollment, racial and discipline problems, and attendant bad

publicity. Students and staff are sensitive to criticism.

"I think the kids here deserve as much of a chance as anybody else," said Warner.

She knows it's hard to do well in school and earn a living at the same time. Ricardo is one of seven children and works 25 hours a week — like his older brother before him — in a restaurant after school.

It was Ricardo's brother, who was a Barbara Warner math student, who encouraged a sister to take calculus, and both in turn encouraged Ricardo. "My sister says she's having an easier time in calculus at Davis because of the classes she took here," Ricardo said.

Warner, who went back to college several years ago to earn a master's degree in counseling, understands that her students must have a high level of motivation to make it. She works hard at helping them reach — and keep — that level.

A Barbara Warner math class — whether it is calculus or remedial math for students who have failed proficiency tests — is an exercise in involvement. "You go to the store, and everything is 20 percent off, but they don't figure it out for you. You have to figure it out for yourself," she explained.

It's information for those in one of two Warner classes in remedial math for students who can barely add, much less figure percentages. She succeeds in making it real. The kids are delighted to learn that 20 percent means they can get a \$20 pair of jeans for \$16.

"We learn how much you pay on time. Once we figured the sales tax on a car, and they got very upset about that," she said.

Using an overhead projector instead of a blackboard — "That way I can see the students' faces, and their reactions" — Warner keeps up a constant conversation with her students, who alternately whoop and groan at the revelations on the screen.

"I know when I was taking calculus, I did it, too," she recalled, with no interruption in the flow of her pen on the plastic projector scroll. "You learn by your mistakes. So far so good?"

The calculus students, furiously writing in their notebooks, nod assent. Some ask questions. If Warner sees a student stopping or puzzled, she immediately asks what's wrong.

"What you're seeing, Charles, is what I was talking about.

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Bee photo by Owen Brewer

despite the difficult times. Some is available at \$1.10 a square foot and street frontage is going for \$1.75 to \$2

are because we represent the lessor," he said.

lots, says that

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You're seeing the arithmetic errors. Save your brain. Give yourself a break. I'll bring it around here and make it a little neater. We're making mountains out of molehills with a lot of these problems.

"Shall we keep this quotient? Will that make you happy? Oh, that won't make you happy?"

The students laugh. Warner smiles, keeps writing, talking.

"That got a little ahead of the game. That was a couple of sections ahead of us. But Ricardo is right. You can expect something like that tomorrow, though. That's a guarantee."

From the students, a pained "Ohhhhhh!"

"When you leave in June, your algebra will be second nature — unless you don't put out the effort you're putting out now. I really guarantee it. I remember a student who had taken his college math tests and made a simple little arithmetic error and blew the whole thing. The arithmetic has to become second nature."

When she finishes with the projector, she moves around the room, checking students' papers, offering advice, making corrections. "You've got to keep everything going," she says. "You can't just sit at your desk." Her room is filled after school with students asking questions, helping each other.

There is a test in calculus the next day, and the students are anxious.

"The test tomorrow is very mechanical," she tells them. "It doesn't have a lot of theory. Go through it all the way first. Don't stick on one problem for 20 minutes. You won't finish if you do that.

If something is bugging you, go back to it. We haven't had many absences, so not many of you are behind. Get together and work on it tonight. Help each other."

Out of 18 students in the calculus class, 11 are girls. Warner is proud of that turnaround. "I used to keep posters on the walls of famous women in math history — including some who were killed for being too smart."

She works closely with female students who are bright in math, but — like most girls — do not continue beyond high school geometry.

"I don't want them to go on if they don't have the ability, but if they do, I push it," she explained. "I tell them don't cut your options, don't limit your choices later on. I have one girl taking calculus who wants to be a rabbi. She's taking it because she likes it. Who knows, maybe she'll need it someday."

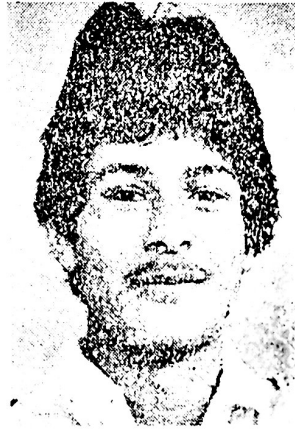
Terrie Robinson, 17, is taking calculus — not because she needs it for academic credit (she plans to major in political science, then go to law school) — but because it's hard. "It's a challenge," said Terrie, who is student body president. "I have to apply myself. I'm fair in math, but not great. Mrs. Warner can break it down to my level."

Elizabeth Jackson, 17, plans to be a doctor. She has that wide, even gaze of a kid who knows exactly where she is going. She says that Warner "is the best math teacher I've ever had. If you don't understand something, she'll go back over it until you do."

"They say girls don't have mathematical inclinations," Elizabeth said. "They're wrong."



SYLVIA ZACHARY
... only black in college calculus



RICARDO ZARAGOZA
... now an engineering major



TERRIE ROBINSON
... calculus as a challenge



ELIZABETH JACKSON
... plans to be a doctor



Bee photos

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