

# RECRUITING MORE MATHEMATICS TEACHERS USING COLLABORATION AS THE MAIN INGREDIENT: AN EFFECTIVE MODEL FROM MISSOURI

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## Abstract

A National Science Foundation grant was designed to develop a series of courses to connect mathematics concepts taught in middle school classes with actual class materials used at the middle school level; however, a second component of the grant focused on efforts to recruit more teachers into the field of mathematics. By collaborating with several groups across Missouri, several strategies were developed that were shown to have positive results, both in increasing awareness of mathematics teacher shortage issues, and in encouraging attendance in Missouri mathematics education programs. The strategies developed were easy to implement and low in cost. The Missouri team encourages others to duplicate or adapt this recruitment model in their own regions.

## Introduction

Waiting to see who shows up on the doorstep of the math department is no longer an option when considering the serious shortage of mathematics teachers throughout the country. The statistics are sobering: the No Child Left Behind website states that “just 41% of teachers of mathematics had math as an area of study in school.” [1] Other reports estimate that about 30% of mathematics teachers lack state certification in their field [2-3]. Districts make valiant efforts to employ fully certified mathematics teachers, but in many cases find that those individuals do not exist. Consequently, they call upon alternative teachers or full-time teachers certified in other areas to teach mathematics.

Despite the best efforts of teachers employed in such cases, the research shows that lack of a solid background in mathematics can have a negative impact on student achievement. The National Assessment of Education Progress reports that eighth grade students of teachers with mathematics majors or minors perform higher than students of teachers without mathematics majors or minors [4].

In Missouri, the shortage is evident. Approximately 500 mathematics teaching vacancies are posted annually while fewer than 200 middle and secondary mathematics teaching certificates are issued each year by the Missouri Department of Elementary and Secondary Education from all 34 college mathematics education programs combined [5].

That's not going to cut it. The new federal No Child Left Behind Act calls for all teachers in schools receiving federal funds to be "highly qualified." That is, teachers must hold a bachelor's degree and meet state certification requirements—they cannot have certification requirements waived or be on an "emergency, provisional, or temporary" certificate. These requirements are mandatory by the 2005-06 school year. Each state's department of education is in the process of writing rules that incorporates the law into its certification process. The Missouri Department of Elementary and Secondary Education has mandated that teachers with any kind of certification (including temporary or provisional) will be counted as "highly qualified." Nevertheless, the need for excellent math teachers will remain a challenge as student test scores continue to receive ever greater scrutiny.

So what is the answer? Like any complex equation, simple formulas are not likely to work. An extended, cooperative effort on many fronts is needed. Activities from an NSF-funded grant called Connecting Middle School and College Mathematics or (CM)<sup>2</sup> have made great attempts to identify, recruit, and train new mathematics teachers for Missouri schools. The steps below describe the plan of action implemented in Missouri, but we believe these low-cost efforts can be duplicated and adapted for other regions.

### **Step One: Forming the Team**

One of the first steps taken was to coordinate a statewide meeting with mathematics faculty from all the public institutions in Missouri. The result was an active exchange of ideas for promoting the field of mathematics teaching. From there, the ideas generated were sorted and further developed into workable projects. Using the financial backing from the (CM)<sup>2</sup> grant, a recruitment team began to actively work on the project ideas for promoting the field of mathematics teaching to potential markets. The team involved mathematics faculty, mathematics education faculty, and graduate assistants and staff with experience in recruitment and teacher placement.

Statewide meetings continued for two years, with two meetings each year, where everyone was updated on the status and results of the recruitment projects. Territorial issues disappeared as a spirit of collaboration took hold and the statewide meetings became important occasions to share information among colleagues.

### **Step Two: Develop a Website**

A website identifying a faculty member at each four-year public institution in Missouri was established to distribute information and opportunities [6]. The goal of the website was to promote mathematics teaching as a career choice while simultaneously promoting the mathematics education programs at each institution. One of the universities donated server space to host the site and graduate assistants skilled in web design developed the site.

### **Step Three: Partner with High School Mathematics Teachers**

Many college students have told us they chose teaching as a career because they were influenced by a teacher they had in school. To make use of this powerful army of “ambassadors,” we asked high school mathematics teachers around Missouri to help us identify strong mathematics students in their classrooms. We received a good response and developed a database of potential future mathematics teachers. A brochure was mailed to each identified high school student encouraging them to consider the field of mathematics teaching and letting them know the name of the teacher that recommended them. Over a period of two years, close to 1,300 high school students received a teacher recommendation and brochure.

The brochure we used was a focused communication piece to “get the good word out” about mathematics teaching as a career. The field of teaching as a whole has negative stereotypes related to salary, which at times can overshadow a talented student’s desire to help others through teaching. We specifically focused on providing accurate information about starting salaries and student loan forgiveness, while also promoting the “make a difference” appeal that teaching offers. The brochure pointed interested students to the website where contact information on all the Missouri mathematics education programs could be found. A copy of the brochure and letter was loaded onto the website [6].

**Step Four: Partner with College Admissions Offices**

It is commonly known that once students enroll in college, the choice of major is subject to change. Relying on this assumption, we further targeted new students at the University of Missouri-Columbia who had strong ACT subscores in mathematics and undecided majors. Using a list of names and addresses obtained from the college admissions office, we promoted mathematics teaching through the use of a brochure (the same brochure used for high school students) and a letter encouraging students to consider the field of mathematics teaching as a possible career.

**Step Five: Partner with School Administrators**

School administrators are no stranger to the mathematics teacher shortage issue—they struggle with hiring situations in this area every year. They sometimes feel, however, that they struggle alone. Many school administrators have a deep pile of elementary applications, but no openings in elementary education. At the same time, they are desperately trying to fill math teaching positions for which there are no qualified applicants. It is no wonder that the cry is sometimes heard, “What are you college people doing? Don’t you know what we need here?” In addition, hiring officials in school districts frequently come into contact with individuals interested in teaching, but lacking appropriate certification. Connecting with school administrators can be an important step in promoting mathematics education programs.

In Missouri, school administrators participate in a variety of regional and statewide meetings at different times of the year. To reach this important group, we proposed meeting topics and conference presentations to several related professional organizations across the state. Each time a proposal was accepted, it gave us an opportunity to communicate our efforts at recruiting more mathematics teachers, and inform school administrators about mathematics education programs in the state. The result was twofold: school administrators began to see that we were listening to their needs and actively working to address the issues, and the availability of traditional and non-traditional teacher training programs was promoted.

**Step Six: Partnership with Journalism Students**

The most challenging goal of the recruitment effort was to reach career changers, as well as to market the field of mathematics teaching on a national level. For assistance, we turned to the journalism department at the University of Missouri-Columbia. The University’s journalism

students are required to complete a capstone project near the end of their program. By contacting a faculty advisor in the advertising sequence, we were able to be designated a “client” for a capstone project. We were assigned three senior-level journalism students who conducted market research. They developed a full-scale campaign, specifically targeted to career changers, that promoted mathematics teaching as a career choice. The financial commitment was small: we covered expenses for the students in terms of copying, phone calls, photos, and supplies. In return, we received ready-to-go advertisements for print ads such as magazines and billboards, as well as suggested scripts for radio and television. Grant funds have been identified that will allow us to use the designed materials.

## **Results**

Obviously, recruitment is not “business as usual” for college mathematics educators. No one told us this would someday be a part of our function as mathematics faculty or college staff members. However, the efforts have paid off with positive results. First, there is an increase of awareness of mathematics teacher shortage issues among college mathematics faculty, high school faculty, and administrators at both levels. Secondly, there is a spirit of comradery that comes from working together to address the shortage of mathematics teachers. A special session focusing on the mathematics teacher shortage is now a regular part of the annual meeting of the Missouri Council of Teachers of Mathematics. Third, the University of Missouri-Columbia noticed a 40% increase in mathematics education enrollment last fall. It is hard to determine exactly what led to such a dramatic increase, but we believe our recruitment efforts played at least some part in the phenomenon.

Ultimately, we believe a continued partnership among colleges and schools can make a difference in meeting the teaching needs of students. The methods we use to recruit more mathematics teachers in Missouri are simple, easy to implement, and low in cost. We encourage other areas to duplicate or adapt these strategies to address teacher shortages in their own areas. Collaboration is the key to addressing the complex problems of teacher staffing and with No Child Left Behind deadlines rapidly approaching, there is no time like the present to get started.■

**References**

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