

Experiencing the MCM at Northcentral Technical College

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Introduction

I became interested in the Mathematical Contest in Modeling (MCM) in the fall of 1985, after receiving the announcement from Tom Kerkes, Dean of General Education. My first reaction was to discard it, as we do not have a mathematics degree-granting program at Northcentral Technical College.

As luck would have it, David Andrews (a fellow mathematics instructor at NTC) and I were presenting a program at the American Mathematical Association for Two-Year Colleges convention in Memphis that fall. While at the convention, I attended the meeting at which Ben Fusaro and a team advisor discussed the 1985 MCM. As I listened to their presentation, my interest level in the contest, as a true learning experience for the student teams, grew. After the presentation, I asked Dr. Fusaro about the possibility of a two-year post-secondary school sponsoring a team. At NTC, mathematics is considered technical support and is geared toward the majors in which the students are enrolled. I like the concept of teams working together to solve a real-world open-ended problem. Dr. Fusaro clinched it for me when he said, "My goal is for the students to learn to work in teams, using as many material resources as possible, and write their suggested solutions. What is important is not the level of mathematics used but that the students participate in this type of problem solving." It was with this vision that I went back to Wausau and started assembling the first team to represent NTC.

Recruiting Students

When NTC first started sponsoring teams, I personally recruited students from my mathematics classes who appeared to have good mathematics skills and liked solving problems. I would check with the students' major

instructors to let them know the kind of students that I needed and to get the instructors' support to encourage the students to participate. Now it is more of a joint effort among Frank Fernandes, Rita Keilholtz, the student life manager, and myself. We put articles in the college newspaper and the weekly newsletter *College Beat*. Rita puts me on the agenda for a Student Governing Board meeting in early fall. I explain what the contest is about and why we encourage students to participate, as well as thank them for their support of the contest. Usually, I will get one or two students who express an interest in participating, and thus begins the list of participants.

Previous students who have participated have expressed great satisfaction with the experience. They really enjoyed the challenge and the learning experience that goes along with the contest. One student participant came back in the fall and told me that the tech reporting course (a required communications class for all associate degree programs) that he took during the summer following his first experience in the contest was more meaningful to him because of the experience of the contest. The experience of the contest reinforced the topics covered in tech reporting and made it easier for him to understand the need for good technical reports. He participated for a second year and returned to help supervise the contest the third year.

One year, I assembled a team of three female students. They were talked out of competing by another instructor, and I had to work hard to get them back into the contest. At the banquet to celebrate the participation, one of them got up and stated that it was indeed a true learning experience; and all three were glad that they had participated.

Building Support

To get other faculty support and interest in the contest, I talk to those whom I know have a desire to see the students learn more than just classroom learning. Once I explain the merits of the contest—team participation, and mathematics and writing skills—I find them willing to support the experience. I talk about the contest at departmental meetings and at general education divisional meetings, whenever I can get the contest on the agenda. As new faculty come to our campus and into the General Education Division, I share the contest information with them and seek their assistance. The first few years, I was doing everything myself: getting teams together, arranging for the use of the facilities, shopping for the food, and seeing that the papers were mailed on time. Now it has become more of a faculty team putting things together and assisting in all phases of the contest.

We first sought financial support from business and industry in 1993–94. We requested a sponsorship of \$250 per team, for which the sponsor gets an invitation to the banquet, a plaque, and their firm's logo printed on a T-shirt given to each participant, advisor, and sponsor. The effort raised

\$1,300. The banquet is hosted by the college president, a tradition since the first contest. Each student also receives a college paperweight engraved with their name and year of participation. At the banquet, the students share their experiences with all present and receive a printed booklet of the year's NTC team entries. Also, a copy of the booklet is sent to the library, to become a permanent part of its collection.

At the 1994 banquet, we had a good turnout of sponsors. They felt that the contest was very interesting and a rewarding experience for the students. The banquet gives a time for the sponsors to meet with the college president, faculty, and students in an informal setting. I believe it gives the employer sponsors a closer tie to the college and helps them to understand what our students are capable of doing, in and out of the classroom.

Training

The training and precontest information is done between January and the contest date. We have four meetings, with all the students present. The first meeting introduces the students to teamwork and what mathematical modeling is about. The second meeting, done by the Communications Dept., stresses the important elements of writing a technical report and the brief summary needed. During the third and fourth meetings, we train the students on the computers and the various programs that are available to them, as well as find out what they already know about computers and calculators. In 1994, some of the students used the TI-85 graphing calculator to run simple programs, testing them before setting them up on the computer.

In 1995, we offered a one-credit-hour class in mathematical modeling (and also gave a second credit-hour to those who participated in the contest). The course develops the modeling mindset for the student, as well as showing the importance of teamwork. We have 18 hours available to do some modeling problems and develop understanding of the modeling process. It is mostly hands-on, with very little teacher-led lecture or demonstration.

Conclusion

I would like to relate a story from one of the participants in the very first contest. The reason that I recruited this student was that she had a calculus background and in less than nine weeks had finished the Tech Math 1 course and the first half of Tech Math 2, both with a 98% average. I also found out in talking with her that she loved problem solving.

At the banquet, she asked how knowledge of problem solving could be made known to potential employers when it was not shown on her tran-

script. I told her to include it in her resumé.

In the spring after graduation, she stopped by and stated that she had been hired by a company in Minnesota and that she felt that she got the job partly due to her experience in the modeling contest. During the interview, the personnel manager had seen on her resumé mention of "MCM 86" and asked her what it was about. After her explanation, he stated that he loved the idea and concept of the contest. This one comment has kept me working on keeping the contest going at NTC for our students.

About the Author



Bob Henning was born in Milwaukee. When he was in the fourth grade, his family moved to Grafton, Wisconsin, where he attended a one-room schoolhouse. In the eighth grade, he had a teacher whose hobby was mathematics.

"He gave a problem of the week to challenge us. Through these problems and his tutoring, my love for mathematics began and grew. In high school, I took all the mathematics I could, as well as industrial arts. I went to college to become an industrial-arts teacher; in my freshman year, another mathematics instructor influenced me to minor in mathematics."

Bob has a B.S. in industrial arts education with a minor in mathematics and an M.S. in vocational education from the University of Wisconsin–Stout. Over the last 30 years, he has taught mathematics to vocational students enrolled in such fields as machine tools, agricultural mechanics, welding, and prep algebra. Northcentral Technical College has awarded him the title of Master Teacher.

"My richest experience was teaching blueprint-reading and mathematics to apprentices from all the various trades. Currently, I am working on a second M.S. degree, in mathematics education, from the University of Wisconsin–Oshkosh. It was the contest and Dr. Fusaro that motivated me to try for it; the contest put everything into perspective for me in terms of problem solving, communications, and applied mathematics, as well as the needs of industry in team problem-solving across the disciplines. My rich experiences from industry and my need to teach students to use mathematics as a tool keep me working and studying in this arena. A personal thank-you to COMAP for ensuring that the contest keeps going!"