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Motivating and preparing future engineers a goal of summer day camp

To sample life as an engineer in this year's weeklong *Expanding Your Horizons @ WMU Engineering* day camp program, 36 area seventh and eighth graders built Popsicle-stick bridges strong enough to hold more than 40 pounds and robots that could maneuver a maze, knock down soda-pop cans, and hit a golf ball.

Crushing bridges...

Middle school students watch their bridges crushed by WMU civil engineering seniors **Joseph Barbera** (left) and **Brad Stempihar** (right) who performed weight tests on bridges designed and built from 60 Popsicle sticks and glue. The bridges held from 40 to 125 pounds before collapsing.



The students, who attend middle school at Kalamazoo's Milwood and Parchment, Paramount Charter, and Otsego worked with WMU college students majoring in electrical and computer engineering (ECE) and civil and construction engineering (CCE).

WMU students who assisted the program include CCE majors **Joseph Barbera**, **Brad Stempihar**, and **Ammar Zalt**; ECE majors **Ishrak Mamun**, **Ivana Krenata**, **Eddie Quada**, and **Bryan Berger**; ECE Ph.D. student **Imad Zyout**; and Kalamazoo Area Math and Science Center volunteer **Omar Abudayyeh**.



Working together...

Working in teams, area middle schoolers used WMU computers to design and test robot and bridge designs and to create presentation material of the projects

Half the students involved in the project built nine bridges, and the other half built nine robots. According to **Barbera**, a civil engineering graduate student, the bridge builders used 60 Popsicle sticks and glue to create a bridge that spanned 10 inches. "They watched videos on bridge designs and they used WestPoint Bridge Builder software to test their designs via computer simulation," he said.

The robot builders used a variety of techniques to control the movements of the nine robots. Some of the students clapped their hands to direct their robots; others used light that followed tape along the floor.



Getting help... WMU volunteers assisted day campers

The program was directed by **Dr. Ikhlas Abdel-Qader**, an associate professor in the ECE department as part of a \$245,000 grant from the WMU President's 2005 Innovation Fund for the project, "WMU-Kalamazoo Promise Partnership: Promoting Engineering Careers to Female,

Testing robots...

WMU students **Bryan Berger** (left), **Imad Zyout** (right), and the Paramount students (center) who designed the robot watch the robot maneuver a maze. The robot is following the tape line through the maze. Robots also knocked over cans and hit golf balls.



Minority and Economically Disadvantaged Middle School Students." **Dr. Sherif Yehia**, a CCE associate professor, and **Dr. Edmund Tsang**, associate dean of CEAS, are co-contributors to the project.



Preparing presentations...

Area middle school students enjoyed WMU Parkview Campus facilities. In the foreground, two middle school students create a poster of their project; in the background, several middle school students test their robots' ability to hit a golf ball.

"Our goal is to motivate and prepare middle school students to pursue college studies in engineering, technology, sciences, and mathematics fields," Abdel-Qader said. "We want to help students take advantage of the Kalamazoo Promise."

Opinions and ideas, please! Send your thoughts on this article or suggestions for future articles to the editor at jerrie.fiala@wmich.edu. Thank you.