

# Sociologist: Why do more women study engineering in Muslim nations than in U.S.?

WSU sociologist **Julie Kmec** is leading a new study that aims to understand why significantly more women per capita study engineering in some predominantly Muslim countries than do counterparts in the United States.

Funded by a two-year, \$589,200 National Science Foundation grant, the study seeks to identify the mechanisms that motivate women to pursue engineering in Jordan, Malaysia, Saudi Arabia, and Tunisia, where participation rates by women are as high as 50 percent. In the U.S., approximately 15-20 percent of engineering students are women.

“The U.S. government, industry and professional societies have allotted tremendous resources to increase women’s participation in engineering—with minimal impact,” said Kmec, professor of sociology and Edward R. Meyer Distinguished Professor of Liberal Arts and one of the study’s two principal investigators.



Julie Kmec

The researchers hope the work leads to greater understanding of the constraints that shape women’s participation in engineering and new ways to increase the number of women study engineering in the U.S.

## Engineer shortage weakens U.S.

The shortage of engineers in America weakens the country’s position as a global market lead and limits its capacity to solve key infrastructure challenges, said Jennifer DeBoer, assistant professor of engineering education at Purdue University and a principal investigator with Km

Gaining a competitive edge in sectors that rely on science and technology depends on identifying the factors that inhibit participation of competent and interested women in engineering field the researchers said.

“Although women in the U.S. earn more undergraduate degrees than men, they receive fewer engineering degrees and hold fewer engineering faculty positions and fewer private sector engineering jobs than men,” said Kmec.

“The paradox is that women’s engineering participation has expanded significantly in many predominately Muslim countries,” said Nehal Abu-Lail, an associate professor in the Voiland School of Chemical Engineering and Bioengineering at WSU and a co-principal investigator on the project. “This expansion is likely due to cultural and financial norms as well as national educational paradigms that look so different from those adopted in the states.”

### **Surprising because of cultural restrictions**

The WSU and Purdue researchers are collaborating with colleagues at Western Washington University and at Princess Nourah bint Abdulrahman University (PNAU) in Riyadh, Saudi Arabia to identify the “micro- and macro-level facilitating conditions” behind the relative numbers of women engineers in Jordan, Malaysia, Saudi Arabia and Tunisia. They will conduct focus groups with three distinct sets of women: engineering students, engineering faculty and engineers in industry.

“These micro- and macro-facilitating conditions refer to what’s going on for individual women given time,” DeBoer said. “Macro conditions are the policy-level conditions, the cultural environment, the overall political climate for women’s rights—for example, what labor laws exist to require equal treatment,” she said.

“Women’s engineering participation in predominantly Muslim countries is surprising for reasons beyond just the absence of collective national STEM-focused (science, technology, engineering and math) programmatic efforts to increase representation,” Kmec said. “Women in predominant Muslim countries typically experience social, political and economic restrictions. In contrast, certain indicators suggest women’s status in the United States is among the highest in the world.”

Also a co-principal investigator on the project is Ashley Ater Kranov, an adjunct associate professor in the WSU School of Electrical Engineering and Computer Science and interim vice dean of electronic and distance learning at PNAU.

The research aligns with WSU’s Grand Challenges, a suite of research initiatives aimed at large societal issues. It is particularly relevant to the challenges of promoting opportunity and equity and harnessing technology to improve smart systems and overall quality of life.

-By J. Adrian Aumen, with thanks to Emil Venere, Purdue Uni

