Mo., Kan. public colleges still seek minorities

Some major public colleges in Missouri and Kansas say a recent U.S. Supreme Court ruling on affirmative action won't affect their efforts to recruit minority students because race already is not a factor in admission standards.

**However, increasing diversity on campus by recruiting more minorities remains an important goal, according to officials at the University of Missouri-Kansas City, the University of Missouri-Columbia, the University of Kansas and Kansas State University.**

The Supreme Court ruling in June didn't forbid considering race in admission but said schools must prove there are "no race-neutral alternatives" to achieve diversity on campus.

"I think that any public research institution that is using race as a factor in admissions needs to go back and review what they are doing," said Mel Tyler, vice chancellor of student affairs at the University of Missouri-Kansas City. "There are plenty of qualified minority students out there. Race should not be a factor."

Generally, students who meet basic criteria for admission at the schools will get in, The Kansas City Star reported (http://bit.ly/12PYPFv).

In Kansas, the requirements are at least a 2.0 grade point average, a 21 ACT score or rank in the top third of a graduating class. In Missouri, residents who graduate in the top 10 percent of their class and meet the 17 core curriculum requirements can get in regardless of standardized test score. But the lower the class rank, the higher the test score needed for admission.

The schools generally encourage minority students to apply and then allow all applicants who meet the criteria to enroll. Changing demographics make those efforts important. By 2030, Missouri and Kansas students now considered a minority will make up 50 percent of the population, Tyler said.

Pat Bosco, vice president for student life and dean of students at Kansas State University, said the Manhattan school concentrates on recruitment, rather than selection. The university recruits students in areas with large populations of first-generation and minority students, then offers them financial assistance and academic support to help them graduate.

"K-State is an output school, not an input school," Bosco said. "We are not spending time on selection, but we are spending time showing students how they can be successful once they get here. We don't just throw them in the pond and hope they swim."
The University of Kansas also coordinates several recruitment events each year to target minority students, said office director Lisa Pinamonti Kress, and has a team of current students who write, call and meet prospective students.

At the University of Missouri-Columbia, admissions director Barbara Rupp said improved recruitment has led to increased minority enrollment in the past 10 years — including looking for qualified students in Kansas City, St. Louis and out of state, particularly in Chicago.

First-time black freshmen on the Columbia campus increased from 209 in 2002, or 5.6 percent of the student body, to 657 last year, more than 8 percent of the student body. The number of new Hispanic freshmen increased from 70 in 2002 to 232 in 2012.

At Kansas State, the number of minority student applicants has increased from 918 in 2007 to 1,554 in 2012. And at Missouri-Kansas City, enrollment of black, American Indian, Asian and Hispanic students has increased 77.5 percent increase in the last 10 years, Tyler said.
COLUMBIA MISSOURIAN

MU's Carbon Recycling Lab at work on water-recycling toilet

By Brendan Gibbons
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COLUMBIA — Miso soybean paste, cellulose, yeast, psyllium husk, oleic acid, sodium chloride, potassium chloride and calcium chloride.

That's a recipe for fake poop.

**Engineers at MU’s Carbon Recycling Center are getting pretty good at processing this hummus-colored sludge with their water-recycling toilet. Their effort is part of the Reinvent the Toilet Challenge, sponsored by the Bill and Melinda Gates Foundation. The MU lab is working with engineers at Duke University to develop a new toilet technology for water-scarce parts of the world.**

“The problem is, everybody creates poop,” said Nikolas Wilkinson, a recent master’s degree graduate working in the lab over the summer. “And it’s obviously biologically hazardous, so you have to do something with it.”

Toilets in the developed world use between 1 1/2 and three gallons of water with every flush. People in developing countries who are caught in the stranglehold of water scarcity can’t afford to waste so much precious drinking water. Solving this problem means rethinking how water is used to process solid waste.

The MU lab’s experimental toilet uses water like an ordinary toilet, but because the water it uses is superheated and super-pressurized, its toilet can do what ordinary toilets can’t — dissolve waste and then fully consume it in an intense, heat-producing oxidation reaction.

“The big idea is that when it’s done, you’re going to be able to recover all the water,” said Brook Remington, an undergraduate student who works in the lab. “You’re going to end up with clean, sterile water at the end.”

The water used in the reaction is heated to about 1,100 degrees Fahrenheit and 250 times the normal atmospheric pressure, Wilkinson said. Because of the heat, it should be a gas. Because
of the pressure, it can't be. When a liquid undergoes such an identity crisis, it becomes "supercritical."

Supercritical water has unique properties. The water spreads out to fill as much space as possible, like a gas, but it also can dissolve solids as it would in liquid form.

Dissolving the waste makes for a more efficient reaction because it increases the surface area of the fuel.

“If you had a giant wood log, it would only burn at the surface,” Wilkinson said. “Since we can dissolve it in there, we have a lot more surface area per mass, and so we can get really high reaction rates.”

The toilet works like this:

Three thin pipes lead to a small metal cube. One tube carries supercritical water and another provides oxygen. The third tube delivers solid waste at a minimum of 4.5 milliliters per minute. When the three inputs meet inside the metal cube, the reaction begins.

Wilkinson and Remington speak of the solid waste “burning,” but they’re quick to point out that it doesn’t burn with an open flame, the way a log would. Despite their understanding of the chemistry at work, they have a hard time forming a mental image of exactly what goes on inside the metal cube.

“It’s very difficult to picture,” Remington said.

“The way I think of it, just as a simplistic model in my head, is if you had three hoses and you just shoot them at the same point and they get kind of chaotic,” Wilkinson said. “Except in this case it’s all going out one tube at the end.”

The mixture that forms in the cube flows into a coil of thin pipe, where the water cools as the waste is consumed, leaving only clean water, carbon dioxide and a few solids.

The beauty of this toilet is its potential for promoting reuse of materials and energy, Wilkinson said. Water fed into the reaction emerges clean. The heat generated can be used to preheat water for the next round. The solids byproducts, such as nitrogen and phosphorus, could be used for fertilizer.

Some major challenges will have to be resolved before the toilets can be put to widespread use.
Supercritical water is highly corrosive, Wilkinson said, and the engineers often have to replace metal pipes and joints that come into frequent contact with the water. The waste tube also tends to clog.

Finally, the engineers have to fine-tune the heat, pressure and oxygen concentration to create the most effective reaction. After they finish their work on the project, they will hand it off to Duke University.

Doug Hendry, who earned his Ph.D. at MU in 2012, moved to Durham, N.C., last week to continue the project at Duke. Hendry said Duke's version of the toilet will be four to six times larger and will fit in a 20-foot shipping container so it can be sent abroad.

Construction on the Duke version will begin in September, Hendry said. He expects it will be operational by March 2014.

The MU-Duke partnership came about after Duke received a $1.2 million grant from the Gates Foundation. Duke had originally intended to work with a private company, MU biological and chemical engineering professor Bill Jacoby said. Then the deal fell through, and Duke professor Marc Deshusses turned to MU after reading some of the publications on solid waste treatment that Jacoby and his students produced.

For about five years, the engineers in MU's Carbon Recycling Center have been studying the use of supercritical water oxidation for solid waste disposal. Personnel from the MU and Duke labs began meeting in January, Jacoby said. MU received $200,000 of Duke's grant money and began work on the project in April.

Jacoby emphasizes the crucial importance of biomass, a catch-all name for living or recently living tissues. Nearly every type of fuel is, or once was, biomass. Exploring new ways to use biomass is his lab's mission.

"Biomass is our carbon resource," Jacoby said. "It's our only carbon resource."

Supervising editor is Scott Swafford.