

Powered by poo: Students use dog waste to light park

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Dogs meet and greet at the Cosmo dog park in Gilbert, Ariz. ASU students have developed a way to use dog waste to power a light at the park. Photo by: Allie Nicodemo/ASU

Every day, about 200 dogs and their owners visit the Cosmo dog park in Gilbert, Ariz. When they go home, they leave behind about eight cubic yards of dog waste, plastic bottles, bags and other trash.

Normally, all of that junk ends up in a landfill. But starting this month, the little gifts that Fido leaves will be used to power a light at the park, thanks to a team of engineering and technology students from ASU's Polytechnic campus.

The "dog waste digester" was created as part of the College of Technology and Innovation's iProjects program. The student team includes Aaron Nelson and Sean Burris from mechanical engineering,

Jesus Vasquez from electrical engineering, Ryan Williams in civil engineering, and Bryan Bowles, who majors in environmental technology management. Michael Ingram, a graduate student in alternative energy, also is engaged in the project, assisting his undergraduate colleagues.

Team member Aaron Nelson, a senior in the College of Technology and Innovation, said dog waste will be broken down in the septic tanks through a process called anaerobic digestion, which takes place in the absence of oxygen.

“Microbes in the waste use it as a food source,” Nelson said. “A byproduct of the anaerobic digestion process is biogas, a combination of methane, carbon dioxide, water vapor and other gases.”

One of the challenges in designing an anaerobic digester was finding a way to keep the system cool enough to function during the summer months, when temperatures regularly exceed 110 degrees. Nelson said their solution was to bury the system underground, where it will be kept below 100 degrees. The underground design also prevents any unpleasant odors from reaching the noses of visitors at the park. Patrons can deposit their [dogs](#)’ waste into the system through specially designed openings. They also can help the digester work by giving its contents a stir.

“That allows them to interact with the system, but it also helps the digestion process by mixing the waste around,” Nelson said.

The City of Gilbert raised \$25,000 to help fund the project, with additional donations from companies in the Valley that deal with waste disposal. Ultimately, the digester will help the city save money by eliminating the cost of collecting the dog waste and taking it to a landfill. It will also benefit the environment by reducing atmospheric emissions of methane, a greenhouse gas that contributes to global warming.

Protecting the environment with help from adorable, four-legged friends has captured a great deal of public attention. The Purina pet food company even featured the project on their “petcentric” website.

But the iProjects program serves a less flashy, but vitally important goal – connecting students with industry to solve real-world problems. Nelson said the experience has required him to think beyond the scope of his major and work with students from different backgrounds.

Micah Lande is an instructor at the College of Technology and Innovation and one of two faculty mentors for the team. He said the project has given students the opportunity to apply what they learn in the classroom and hone their problem-solving skills.

“The iProjects are first and foremost learning experiences – a safe place to explore and maybe fail. Our students have changed their design a number of times, and that’s what an engineer does,” Lande said.

The team’s other faculty mentor, Kiril Hristovski, is an assistant professor at the College of Technology and Innovation. He said the iProject program’s interdisciplinary approach is part of what makes it such a valuable experience.

“The future engineers have to come out of an educational experience with deep knowledge in a specific discipline, but also develop the ability to collaborate with different professionals from a broad range of disciplines. The iProjects achieve exactly that,” Hristovski said.

Hristovski says local partners and industry have been very supportive of the iProjects program because it produces students who are able to “hit the ground running” when they enter the workforce.

Many of the projects have a component of “community embeddedness,”

giving students the opportunity to demonstrate their capabilities and achievements while also making a positive difference in their community and the world.

Hristovski and Lande believe that project-based learning is the next logical step towards creating engineering education for the future.

“Reinventing the education, reinventing the way we teach, that’s one of the primary missions of the College of Technology and Innovation,” Hristovski said. “Here, faculty and students have the opportunity to prototype the future.”

Provided by Arizona State University

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