

3-D printing to save dogs' day

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3-D printed dog skulls built from computer tomography scans are a lightweight and tough teaching tool. Credit: University of Queensland

3-D printed models of dog skulls are helping University of Queensland vets to save animals and educate tomorrow's veterinary students.

The models, showcased at the World Science Festival, were the result of a collaboration between UQ Library's Digital Scholars Hub and the School of Veterinary Science.

UQ veterinarian and Associate Professor Rachel Allavena used the skulls to help children understand how [dogs](#) with short noses can suffer from the condition brachycephalia.

"Some dogs—like pugs, French bulldogs and Boston terriers—can have such short faces that they have trouble breathing and keeping themselves cool, as they're unable to pant effectively," she said.

"This trait has been selected by humans to make dogs look cute and more flat-faced like us, but it can result in significant suffering or invasive surgical treatments to help the dogs breathe."

"By having 3-D models, we're able to show just how problematic this condition is and to easily explain tricky concepts like this to school kids.

"It also helps us explain why people should consider adopting shelter dogs, which are often greyhounds or mutts, and are generally very healthy and make excellent pets."

UQ Digital Scholars Hub's Nick Wiggins, who developed the models, is excited to use emerging digital technologies for [science education](#)."



Violette examines how the 3D printed model of a greyhound's skull fits with Barney the rescue greyhound. Credit: University of Queensland

"3-D [model](#) creation is becoming more accessible, more affordable and improving in quality," he said.

"In this case, using the medical imaging data of a dog that had a CT scan at UQ, open-source medical imaging software, a low-end 3-D printer and some biodegradable starch-made plastic, we can build something quickly and cheaply that will connect [science](#) to a whole new audience.

"And it's not just [veterinary science](#)—I'm working with a number of other disciplines, including archaeology, palaeontology, botany, zoology, geology, history, and human movement science.

"I'm in discussion with archaeobotanists—archaeologists that look at plant remains—to scan tiny seeds and then 3-D print larger copies to better display their unique morphologies to students."

Dr. Allavena believes educational displays are just the first step for 3-D printing in veterinary science."Beyond veterinary education, 3-D printing is now starting to be used to treat animals, particularly in surgical applications," she said.

"I know of a dog that had most of its skull removed due to a cancer, then had a custom-made 3-D printed titanium plate implanted.

"And surgeons are creating unique 3-D bone models for animals requiring surgery, in order to plan and practice a procedure before it's conducted.

"3-D printing will help us inspire future vets, create better educational outcomes for veterinary students and lead to happier, healthier animals."

More information: Interactive 3-D renderings are available online.

Brachycephalic dog skull: <https://sketchfab.com/3d-models/brachycephalic-canine-skull-335dea8df1a24997a9a82af99d7507b9>

Regular canine skull: <https://sketchfab.com/3d-models/canine-skull-2e74b85370a949a7b576ecb2e859a1fc>

Provided by University of Queensland

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