

A Simulation-Based Learning Tool for Students in the Veterinary Technician Diploma Program at Sheridan Institute of Technology and Advanced Learning

Opportunity

Students in the Veterinary Technician Diploma Program at the Sheridan Institute of Technology and Advanced Learning in Oakville need lab practice involving access to live animals and cadavers. However, this raises ethical issues related to the protection of animal rights and health issues with the use of cadavers and live specimens. Additionally, Sheridan faculty are interested in offering the program online for students at a distance which presents a challenge for providing access to lab facilities for online students.

To address the need for an alternative to live specimens and cadavers, and to provide access to lab facilities for online students, Sheridan is creating a simulation-based web learning tool that replaces and replicates the lab experience using 3D images. As this simulation is created, a framework is also being developed that can be used as the foundation for additional simulation-based resources.

Innovation

This project will provide a unique resource for student learning of veterinary science - the only simulation of a dog skeleton online.

As no digital resources of a dog skeleton are available, the construction of the digital library began with the scanning of a dog skeleton and construction of the 3D images. The scanning and editing of the 176 images took 250 hours. The 3D images of the dog skeleton, such as the skull and spine, can be manipulated to be viewed from all angles and disassembled to look at the specific bones.

These 3D images are the core of the learning tool. In the second phase, to be completed by April 2012, a web-based learning tool is being developed that incorporates the 3D animations, simulations, video, text, images, and quizzes, as well as mobile applications for iPhones and iPads. The web tool will provide a complete package for online student learning with informational and interactive components.

At the same time, a pedagogical and technological framework for the development of the dog anatomy simulation is being constructed using HTML5, the next generation language for structuring and presenting content on the web, and other tools. This framework will serve as the foundation of future simulations for the Veterinary Technician Diploma and other programs.



Simulation-Based Learning Tools for Veterinary Science



Benefits

The simulation of the dog skeleton is a new tool for students in veterinary science. It has been constructed by the staff in the Network for Innovation and Leadership in Education at Sheridan (NILES) in close collaboration with the Veterinary Technician Diploma Program faculty.

The creation of an online repository of digital animals will support student learning and alleviate the need for the lab experience with live specimens and cadavers. Students can use the simulation and the accompanying digital resources to learn at their own pace and respond to their own content and learning needs.

The construction of a framework for the learning tool, including 3D components, text, images, video, quizzes, and possibly audio, will support the development of similar resources for applications in the Veterinary Technician Diploma Program and other faculties with reduced investments in time and resources.

Challenges

The initial challenge was lack of digital resources featuring the anatomy of a dog. It was necessary for NILES to scan the dog skeleton and then build the complete dog structure - time-consuming and exacting work.

The construction of the foundation framework for multiple simulation-based learning tools has involved working with new and evolving web tools, such as HTML5 and WebGL, a web technology that brings 3D graphics to the browser without installing additional software.

The dog anatomy simulation will also be tested for educational effectiveness and its impact on student learning as part of the development process.

Potential

A possible phase three for the dog simulation would provide a complete dog anatomy through the addition of components such as the digestive and cardiovascular systems. Surgical simulations, such as intubation and dentistry, could also be created.

Another program at Sheridan has asked NILES to create an interactive 3D student learning resource on the human skeleton. As digital images of the human skeleton already exist, this resource would be much easier to create, using the learning framework developed for the dog anatomy simulation. The framework can be applied to the creation of similar student learning resources in many different faculties.

The project also has a commercial potential as it is a unique resource that could be of interest to the 33 veterinary schools across North America that enrol about 20,000 students a year.

Sheridan is open to discussions on the model and how it may be applied to learning resources that could be used in post-secondary institutions across Ontario.

For Further Information

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