CUTTING OUT DISSECTION:
BENEFITS OF NON-ANIMAL TEACHING METHODS
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INTRODUCTION

Every year in the United States, an estimated 20 million animals are used for educational purposes.¹ These animals are obtained from a variety of sources and suffer immensely as a result of being trapped, transported, confined, experimented on, and killed for classroom science laboratories.

Millions of frogs, for example, are captured in their natural habitats every year and are killed for dissection or used while still alive in classroom biology experiments. The U.S. Department of the Interior has even stated that declines in amphibian populations can be attributed in part to the use of amphibians in dissection.² Biological supply companies obtain fetal pigs used for dissection from slaughterhouses; the fetuses are cut from the bodies of pregnant sows who are slaughtered for meat. These companies also purchase stray, lost, and abandoned cats from animal shelters or “bunchers”—dealers who illicitly obtain animals from backyards and the streets of the United States and Mexico. Millions of other animals such as mice, rats, and rabbits are bred at facilities that cater to businesses and schools that use animals in classroom experiments and laboratories.

Fortunately, educators can help prevent this suffering and enhance students’ learning experience by using some of the modern, life-affirming, educationally effective non-animal teaching methods that are discussed in this informational brief.

EDUCATIONAL EFFICACY OF NON-ANIMAL TEACHING METHODS IN SCIENCE EDUCATION

Non-animal teaching methods—such as interactive computer programs, high-quality videos, and life-like models—have inherent educational advantages over the use of animal laboratories for science education that translate into superior student outcomes.

Unlike dissection or live-animal laboratories in which students have just one opportunity to perform a procedure and learn the requisite content, non-animal methods allow students to repeat the material until they are proficient and confident without the distraction of mutilating or harming an animal. Further, many software programs include modules that demonstrate how the living body works, side-by-side comparative anatomy modules, and content about ecology and behavior, none of which can be taught with an animal cadaver.

Because of these and other advantages, nearly every peer-reviewed comparative study published has concluded that the educational outcomes of students who are taught basic and advanced biomedical concepts and skills using non-animal methods are equivalent or superior to those of their peers who use animal-based laboratories.³⁴⁵ In one analysis of comparative studies, the authors found that “[i]n all 17 studies reviewed, results associated with the alternative method of instruction were not significantly different from or superior to results associated with the conventional method.”⁶ Another systematic review concluded that students taught using non-animal methods demonstrated “superior understanding of complex biological processes, increased learning efficiency, and increased examination results.”⁵ It also reported that students’ confidence and satisfaction increased as did their preparedness for laboratories and their information-retrieval
and communication abilities. Three recent studies at universities across the United States found that students who modeled body systems out of clay were significantly better at identifying the constituent parts of human anatomy than their classmates who performed animal dissection.\(^6,7,8\) Another study found that students preferred using clay modeling over animal dissection and performed just as well as their cohorts who dissected animals.\(^9\)

The use of non-animal teaching methods also improves preparedness of students who are pursuing careers in the medical professions by better reflecting the teaching methods that they can expect to encounter in graduate schools. Nearly 98 percent of U.S. medical schools—including such prestigious institutions as Harvard, Yale, and Stanford universities—have discontinued the use of animals to teach medical students, and no U.S. medical schools expect or require students to have participated in animal dissection.\(^10\) Furthermore, the American Medical Student Association (AMSA), the oldest and largest independent association of physicians-in-training in the United States, states that it “strongly encourages the replacement of animal laboratories with non-animal alternatives in undergraduate medical education.”\(^11,12\) Today, one can become a board-certified surgeon without ever having cut into an animal—alive or dead.

**ECONOMIC BENEFITS AND EFFICIENCY OF NON-ANIMAL TEACHING METHODS**

Non-animal teaching methods benefit educators by increasing teaching efficiency and lowering costs while affording enhanced potential for the customization and repeatability of teaching exercises.

Studies have shown that computer-based teaching methods “saved academic and nonacademic staff time ... were considered to be less expensive and an effective and enjoyable mode of student learning [and] ... contributed to a significant reduction in animal use”\(^13,14,15\) because there is no set-up or clean-up time, no obligatory safety lessons, and no monitoring of misbehavior with animal cadavers, scissors, and scalpels. With software and other non-animal methods, there is also no expensive disposal of equipment or hazardous material removal. Some programs also allow educators to customize lessons and include built-in test and quiz modules that can track student performance.

Furthermore, animals (whether dead or alive) can be used only once, while non-animal resources can be used for many years—an added benefit that could result in significant cost savings for teachers, school districts, and state educational systems. For example, a site license for the popular Digital Frog 2.5, which allows educators to install the software on every computer in their school, costs less than $900 and can be used indefinitely, while the cost of setting up animal dissection for 300 students over a period of five years can add up to $6,850.\(^16\) PETA's Cost Comparison shows similar cost savings for other species as well.\(^17\) PETA has also worked with Digital Frog, Froguts, and other companies to make discounts on their educational software products available. Some programs are completely free and available online. Video demonstrations of select programs, discount codes, and a comprehensive list of available products can be found at [PETA.org/Dissection](http://PETA.org/Dissection).
ETHICAL CONSIDERATIONS AND STUDENT PERSPECTIVE

Concern for animal welfare is at the root of most students’ objections to animal dissection. Research has shown that many students at all stages of their educational careers are uncomfortable with the use of animals in education and experimentation and that exposing young people to animal dissection as “science” can foster a callousness toward animals and nature and can even dissuade some from pursuing careers in science. According to Gallup polls, between 2001 and 2013 the number of young people who are opposed to animal testing rose from 31 percent to 54 percent. Studies show that many students reluctantly participate in animal dissection perhaps out of fear of real or perceived punishment or ostracism from their teachers and peers, and many do not speak up about their ethical objections. For this reason, educators must clearly convey the message that students need not compromise their personal beliefs in order to learn science. Replacing dissection opens the door for a new generation of students who can approach science from a humane perspective.

Many teachers are also opposed to animal dissection in the classroom, citing health and safety concerns, classroom management, learning and retention issues, cost, and the inability to justify killing animals for dissection.

ENDORSEMENTS OF NON-ANIMAL METHODS BY SCIENTISTS, EDUCATORS, AND LEGISLATORS

To reflect technological advances, robust findings about the educational efficacy of non-animal teaching methods, and growing ethical concerns, the National Science Teachers Association (NSTA) amended its official position statement to acknowledge the educational effectiveness of non-animal teaching methods and to support teachers’ decisions to use them as complete replacements for animal dissection. The Human Anatomy and Physiology Society (HAPS) has also revised its position statement on animal use in anatomy and physiology courses to endorse the use of non-animal teaching methods as replacements for classroom animal laboratories.

The NSTA, HAPS, and the National Association of Biology Teachers also advise teachers to be responsive to students’ objections to harming animals by making humane alternatives available upon request.

In the United States, 17 states along with Washington, D.C., have enacted dissection-choice laws or policies that allow students in grades K-12 to opt out of dissection and require teachers to provide non-animal assignments. California, Connecticut, D.C., Florida, Illinois, Louisiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Virginia all have statewide laws or department of education policies that allow students to opt out of animal dissection in favor of a non-animal method. In addition, other states—including Arizona, Hawaii, Minnesota, Texas, and Utah—have more general policies on allowing students to opt out of material that they find objectionable on moral, religious, or ethical grounds. Many school districts, universities, and secondary schools have similar policies in place.
A majority of Canadian provinces—including Alberta, Manitoba, New Brunswick, the Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Québec, Saskatchewan, and Yukon—have similar policies and practices, and their curriculum supports using non-animal methods. See this interactive map for a list of U.S. and Canadian policies on dissection: http://features.peta2.com/cut-out-dissection/step-two.aspx.

Internationally, because of the various benefits of virtual dissection and the inherent ethical concerns associated with animal use, many schools and school districts have ended animal dissection. In addition, several countries—including Argentina, Denmark, the Netherlands, Norway, and Slovakia—have banned dissection at the elementary and secondary levels, while countries such as Australia, India, and Italy no longer include dissection as a curricular requirement. In addition, the government of India has issued guidelines to the Medical Council of India, the Pharmacy Council of India, and the University Grants Commission instructing them to put a complete stop to dissection and experimentation on animals to train both undergraduate and postgraduate students and instead use non-animal teaching methods. In a January 2012 directive, the government stated that non-animal teaching methods such as computer simulations and manikins are “not only effective and absolute replacements to the use of animals in teaching anatomy/physiology but they are also superior pedagogic tools in the teaching of Pharmacy/Life sciences.”

CONCLUSION

Replacing the use of animals in education with one or more of the many non-animal teaching methods available today offers numerous benefits, including reducing the number of animals who are captured in the wild or bred to be killed for dissection, providing students with a more effective and inclusive learning experience, encouraging students to show respect for animals and nature, and conserving the valuable resources of schools and their educators.

We encourage you to visit PETA.org/Dissection for video demonstrations of virtual-dissection software, discount codes for educational software, resource lists, and information about PETA's educational grants program that provides teachers and schools with alternatives to dissection free of charge. PETA also provides online training sessions for science education majors and teachers in dissection alternatives. Please pass along this information to your colleagues and contact PETA if you have any questions or comments.

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