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The use of video in teaching students of physiology

The course of physiology at Odessa Medical University was traditionally organized with both theoretical and practical/experimental parts. It included 45 lectures and 90 practical lessons that aimed to evaluate the students' knowledge and their skill in performing the experimental tasks which were to help them in their future professional work. Therefore, we needed a great amount of experimental animals for the experimental part of the lesson. There were rats, mice, frogs, occasionally cats and rodents, and, rarely, dogs.

Lately, our bad economic situation made us re-assess the use of animals in our experimental aims. Finances for support of experimental work were reduced significantly, and state support of teaching programs dropped to a minimum. This showed us that we should find new and alternative ways for improving medical physiology teaching. Firstly, we found our old TV films which were made many years ago by the central Soviet laboratory for teaching films. These films gave an opportunity for studying background physiology. Then we moved forward, preparing our own films in which the experimental investigations were seen, and using video films received from our colleagues in different medical universities in Ukraine. Some professionally prepared video films were bought abroad, including Hugo Sachs Elektronik and Komplett-Video, Germany. The use of video technique in physiology teaching has its own advantages. Firstly, we can increase the efficacy of the experimental works via using the VT-video options: reply, slow reply, multiply reply, etc. Secondly, video technique increases the efficacy of transmission of information by students — we are dealing with activation of their sensory system. And, finally, it should be mentioned that we can diminish significantly the use of experimental animals.

Of course, it should be stressed that we had a number of problems at the beginning. Our older colleagues failed to participate in this event because of their traditional way of thinking. The next problem concerned the lack of the good quality video films on, for example, the physiology of breathing, Central nervous system physiology, physiology of the blood, cardiac physiology, etc. Taking into consideration all the above mentioned, we may consume that despite the difficult conditions we are managing to improve medical physiology teaching. The use of video technique helps us in this aspect, but with the challenges that we face we need help from foreign organizations which work with alternative methods of teaching.

Comparative Studies for Veterinary and Medical Education

Educational research is a most valuable tool to all educators interested in bettering their teaching. This page is a listing of comparative studies done by educators who, like yourself, were interested in learning if alternative methods worked as well or better than animal labs with their students. Many of these studies can be obtained from Animalearn. If you would like a copy of a study you find here, email us at info@animalearn.org. Or if you would like to conduct your own research, let us know, we can also provide you with the most effective alternatives for your classroom.

Bauer, M.S., N. Glickman, L. Glickman, J.P. Toombs & P. Bill. 1992. Evaluation of the effectiveness of a cadaver laboratory during a 4th year veterinary surgery rotation. *Journal of Veterinary Medical Education* 19(2): 77-84.
Learning outcomes were similar between two groups of 4th year veterinary students, one who was taught surgery using a terminal and cadaver laboratory format, the other taught using survival laboratories.

Greenfield, C.L., A.L. Johnson, D.J. Shaeffer & L.L. Hungerford. 1995. Comparison of surgical skills of veterinary students trained using models or live animals. *JAVMA* 206(12): 1840-1845.
Surgical skills of veterinary students were evaluated following training with dogs and cats or soft-tissue organ models; Performance of each group was equivalent.

Jones, N.A., R.P. Olafson, & J. Sutin. 1978. Evaluation of a gross anatomy program without dissection. *Journal of Medical Education* 53: 198-205.
Learning performances of freshmen medical students using films, computer assisted instruction and prosected human cadavers were the same as those of students taught by traditional lecture and dissection.

Leathard, H.L. & D.G. Dewhurst. 1995. Comparison of the cost-effectiveness of a computer-assisted learning program with a tutored demonstration to teach intestinal motility to medical students. 3(1): 118-125.
No significant difference was found in the performances of preclinical medical students who used a traditional live animal laboratory and those who used a computer simulation on intestinal motility.

Pavletic, M.M., A. Schwartz, J. Berg, & D. Knapp. 1994. An assessment of the outcome of the alternative medical and surgical laboratory program at Tufts University. *JAVMA* 205(1): 97-100.
No difference was found in surgical confidence or ability of veterinary graduates who had participated in an alternatives course of study versus those who had participated in a conventional course of study.

Prentice, E.D., W.K. Metcalf, T.H. Quinn, J.G. Sharp, R.H. Jensen & E.A. Holyoke. 1977. Stereoscopic anatomy: Evaluation of a new teaching system in human gross anatomy. *Journal of Medical Education* 52: 758-763.
Based on physician assistant student learning performances, the authors concluded that use of labeled sequential slides of anatomical dissections provided a viable alternative to dissection.

White, K.K., L.G. Wheaton & S.A. Greene. 1992. Curriculum change related to live animal use: A four-year surgical curriculum. *Journal of Veterinary Medical.* Education 19: 6-10.

After hesitancy in their first live tissue surgery, veterinary students from an alternative surgical laboratory program performed on par with students with a standard laboratory experience.

Erickson, H.H. & V.L. Clegg. 1993. Active learning in cardiovascular physiology. Pp. 107-108 in Modell, H.I., & Michael, J.A. (editors). Promoting Active Learning in the Life Science Classroom. Annals of the New York Academy of Sciences Vol. 701. New York, NY.
Of fourteen learning methods for basic cardiac teaching and ECG interpretation, computer-based active learning was rated the highest in veterinary student evaluations.

Johnson, A.L. & J.A. Farmer. 1989. Evaluation of traditional and alternative models in psychomotor laboratories for veterinary surgery. *Journal of Veterinary Medical.* Education. 16(1): 11-14.
Inanimate models effectively taught basic psychomotor skills, and had the advantage over live animals that they could be used repeatedly, enhancing the acquisition of motor proficiency.

Lilienfield, L.S., & N.C. Broering. 1994. Computers as teachers: learning from animations. *American Journal of Physiology* 11(1): Advances in Physiology Education, pp. S47 - S54.
Medical and graduate students who used computer simulation achieved a significantly higher grade in the cardiovascular section of the final exam than their classmates.

Samsel, R.W., G.A. Schmidt, J.B. Hall, L.D.H. Wood, S.G. Shroff & P.T. Schumacker. 1994. Cardiovascular physiology teaching: Computer simulations vs. animal demonstrations. *Advances in Physiology Education* 11: S36-S46.
Medical students used both computer demonstrations and animal (dog) demonstrations and rated the former higher for learning cardiovascular physiology.