

# Computer-Aided Instruction at ISU

## **Enjoyable, Self-paced, Interactive, Challenging, Instructive, Goal-Oriented, Time-Efficient**

What perceptions do the above terms convey to the reader? These terms describe interactive multimedia instruction. This instructional methodology brings together sound, motion, still images, animation, graphics, and text into lessons which are delivered upon request by computer to the student. The delivery of multimedia education to the student has been delayed due to the cost of computer peripherals and software necessary for providing sound and motion of sufficient quality. However, certain aspects of multimedia are readily available today and can be provided to the veterinary student.

There are a number of frame-grabbers or capture boards for computers that capture still images from videotapes, videocameras, or electronic still cameras and store them in digital files. Slide and color flatbed scanners permit the digitization of images from 35mm projection slides and colored artwork. At the level of resolution which our student computer stations operate, these capture devices and associated software are relatively inexpensive. Once in the computer the digitized images may be modified by various paint and rendering programs; text and graphics may be added if so desired.

A number of authoring software packages are available commercially with which these digitally stored images may be utilized to develop interactive courseware. Variants of authoring software may be used on both the PC and Mac II. Questions and interactive components may also be authored into the lesson. Record-keeping capabilities can be added to provide the instructor with information on how well the student performs on these questions. After completion of an interactive-lesson, the run-time program developed by it can be installed in the various student computer workstations.

One area computers are currently used at ISU are Clinical Case Simulations. As stated by Dr. James Noxon, Associate Professor, Veterinary Clinical Sciences:

“Student participation in clinical case management within the Veterinary Teaching Hospital helps to prepare students for clinical practice, however, the total clinical exposure time is relatively brief. Computers are used to enhance the students’ experiences in patient management through the use of case simulations which are based upon actual patients previously presented to the Veterinary Teaching Hospital.

In computer case simulation, students are given a clinical history of a patient’s problem(s). If they desire, students can actually ‘ask’ for clarification or additional information on certain historical aspects of the case. Students are then given physical examination findings, including photographs from a computer-driven slide projector. Students are given the freedom to ‘perform’ virtually any diagnostic procedure on their patient. If the procedure is life-threatening, they may receive negative reinforcement, i.e., ‘the patient died during the procedure’. Otherwise, the student may proceed with their workup of the patient. When satisfied with their diagnostic results, the student then provides a diagnosis and prescribes treatment for the patient. Feedback is provided following the students entry of their therapeutic plan, and in some cases, the patient may need to be ‘re-examined’ if treatment is unsuccessful. The program used for these simulations also monitors the fees accrued by the client, so that monetary limitations, often found in clinical veterinary practice, can be simulated. The overall goal of the lessons: real-life clinical case simulations!”

Another area of computer aided instruction is being initiated in freshman anatomy. Through college and USDA Instructional Challenge Grant support, Dr. Adams is attempting to facilitate the use of computer-stored images in the classroom. Gross anatomical and respiratory histological images were presented by computer to the first year veterinary class last fall. Some minor problems were encountered, such as the movement of the projection system and computer into and out of the classroom, software glitches, and videocamera focusing problems. These problems are expected to be corrected by the 1992 Fall semester. A computer is available for students to access the images presented in lecture for later study.

Dr. Adams has also enlisted some first year students to help in the preparation of digitized images on surgical anatomy of the dog and cat. The students dissect and photograph anatomical regions layer-by-layer as they progressively incise and retract tissues. The photographs will be digitized for use in interactive lessons developed at a later date. These lessons will be guided by the student with frequent opportunity for input into the computer. Run-time programs that can be loaded onto other computers for student access are now being developed. The goal of the lessons is to encourage self-study and self-testing by students.

The Physiology/Pharmacology department is also using computer aided learning techniques. Dr. Van Meter is developing computer driven laboratory exercises to replace extensive use of live animals in teaching basic science to veterinary students. One reason he gives is that the extensive use of lab animals for teaching, at present and in the future, becomes questionable due to emotional stress on students, poor preparations, poor data acquisition because of lack of experience and growing pressure from animal rights organizations. The cost increases for these animals are also becoming prohibitive. Secondly, the wet laboratory exercises once considered an essential, effective contribution to the learning experience are costly in terms of animals, time, labor, equipment and supplies. Because of reduced teaching budgets, these laboratory exercises have been extensively replaced by demonstrations given to larger classroom size groups or eliminated entirely. One last reason is that laboratory demonstrations, while useful, may fail (the animal may die or not respond as expected). They are also chiefly passive learning, which is not as effective as active interactive learning.

The ultimate goal of computer aided learning is to be able to maintain the benefits of the laboratory exercise teaching environment for students in the

professional veterinary curriculum, without extensive use of live animals and without having to maintain the expensive recorders, and other required laboratory equipment.

Physiological and pharmacological responses of live animals to treatments can be made into artifact free recordings which will be used to create a reusable database of whole animal preparations. A reusable database of in vitro preparations such as the frog rectus muscle, Langendorff heart, and guinea pig atria will also be created. These data bases will provide reusable data from accurately recorded laboratory exercises for students to interpret and analyze. Not only will a savings of time and expenses be realized, but the use of large numbers of animals, both terminal and non-terminal, for teaching will no longer be necessary.

As this article demonstrates, computer aided learning is becoming more widely used here at ISU as it is at other institutions. Clinical case simulations, anatomical computer imagery, and computer driven lab exercises are all methods by which students benefit from modern technology. In the future computers are likely to become more extensively used in veterinary medicine, as it is in other professions.

## Quality Sharpening !

We guarantee you the best clipper blade sharpening and clipper repairing you ever had. More than 40 years factory training. We now service the largest veterinary colleges, veterinary hospitals, and kennels in the USA. Satisfied customers in 50 states and they recommend us: "They are new when we are through." Cleaned, polished and cut. Oster clippers and blades sold. Avoid C.O.D. Enclose \$3.50 for each set of blades plus postage, handling and insurance. \$3.00 per blade order.

Service Grinding & Supply Co., Inc.  
Route 9, Box 9058  
Hayward, WI 54843