

2002–03 Technology-Enhanced Learning (TEL) Grant Proposal Cover Sheet

Title: An interactive case-based tool to enhance problem-solving and content-integration skill development in veterinary education

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Title: An interactive case-based tool to enhance problem-solving and content-integration skill development in veterinary education

Investigation Team: Ava M. Trent (Principle Investigator); Jane Armstrong, James Waddell and Scott Wilson-Barnard (Co-Investigators)

Project Goal: Develop case-based, clinically relevant interactive templates that can be used to develop the clinical problem solving and knowledge integration skills necessary for students to perform effectively in an entry-level clinical setting.

Specific Activities:

1) Develop, evaluate (prototype) and refine an interactive case based on a typical bovine abdominal disorder (left abomasal displacement) that: a) allows students to make diagnostic and therapeutic choices in a clinical context; b) provides information and leads to consequences consistent with the individual student's choice of action as they would occur in a real clinical setting; c) provides specific feedback to the student about the value/appropriateness of their choices; d) can link to multiple learning modules for review of related content, focused self-tests, or advanced challenges; e) allows instructor control of the type and timing of feedback release, and which links to review material will be released; f) can be modified with limited programming experience to develop new cases and alter existing content; g) includes tools to monitor frequency of student access with details on the specific sections/resources accessed.

2) Develop an interactive case and an evaluation plan based on a typical canine or feline abdominal disorder by modifying the bovine case prototype as needed to reflect those diagnostic and therapeutic options that are unique for the selected species.

Evaluation and refinement will occur during the mentorship stage using a group of faculty and students who will then be prepared to develop a 2nd case focusing on a small animal species (4th case in all) under the guidance of the 3 investigators in the primary development phase (Armstrong will lead).

3) Establish an instructional plan for the third case area to be developed. *This case will be developed, evaluated and refined during the mentorship period with a group of faculty and students involved in a large animal or public health area under the guidance of the 3 investigators in the primary development phase (Trent will lead).*

Programmatic Significance: The first case template will be designed using a common bovine abdominal problem with numerous common variations in preparation for expanded admission of students with a food-animal focus in Fall, 2004. The second case will focus on an abdominal problem in a small animal species (cat or dog). The small animal track is the single largest track in the College (and in colleges across the country), and the ability to supplement didactic and clinical instruction with flexible learning opportunities is becoming increasingly important. Subsequent template development will be linked to emerging programmatic needs and outcomes assessment from the first two templates. Two of the investigators (Trent, Waddell) have, as part of their position, an expectation to assist collegiate faculty with TEL projects and one (Waddell) has the

programming expertise to help develop templates in new areas and to expand existing templates to include new cases once the basic design is established.

Course or Courses Affected: The plan for course incorporation begins with a set of courses in the 4-year DVM curriculum [Yrs 1-4] that specifically address clinical problem-solving in areas related to the initial case templates and in which the investigators already teach including: Profession Skills Courses (CVM 6011, 6012, 6013, 6014) [Yrs 1 & 2], Principles of Nutrition (CVM 6134) [Yr 1]; Principles of Surgery, Anesthesia and Critical Care (CVM 6321) [Yr 2]; Digestive System (CVM 6410), Advanced Large Bovine Track Block (CVM 6802), and Small Animal Gastrointestinal Endoscopy (CVM 6416) [Yr 3]; and Advanced Bovine Rotation (CVM 6804), Large Animal Surgery Rotation (CVM 6714), and Small Animal Internal Medicine Rotation (CVM 6601-6604) [Yr 4]. The second tier of courses for expansion includes basic science and graduate courses with related content. An outcomes assessment program to identify areas of student knowledge/skill deficiency as they enter clinical rotations and as they enter practice will be used to identify high priority areas. Faculty will be solicited as members of the planning team as content areas are identified. A separate proposal by the PI for participation in the Faculty Fellowship program further outlines this program and focuses on developing content review modules. The third tier of courses to be involved will be based on the content areas for the third and fourth templates developed.

Learning Outcomes:

The targeted learning outcomes for students include: 1) Enhanced problem-solving skills (general and context specific); 2) Improved recall and application of knowledge in the context of clinical cases; 3) Increased basic knowledge understanding

The targeted learning outcomes for the project investigators include: 1) Effective interactive case template design format; 2) Efficient methods for expansion of the interactive case design to new topics; 3) A clear indication of the next areas for expansion; 4) Further understanding of ways to facilitate TEL development for faculty with the assistance of available technology support

Evaluation Plan: The evaluation plan contains 4 parts:

1) Initial feasibility assessment - This has been completed with the assistance of Scott Wilson-Barnard from the DMC. The interactivity needed is possible using Flash technology. An initial flow sheet for information, feedback and scoring have been developed for Case 1, as well as a rough schematic for a crucial diagnostic graphic interaction.

2) Initial functional assessment - Each case will be tested for ease of use, relevance, and subjective value for students using volunteer student groups and faculty, and used to refine the format before application as a teaching tool.

3) Utilization assessment - Student utilization will be determined through the monitoring system developed in the program and through student self-reporting. Faculty utilization will be determined based on faculty and student surveys.

4) Educational effectiveness assessment - Individual course test scores will be ranked and compared to a utilization score for each student. For courses with a stable instruction and testing system, the mean, standard deviation and range of test scores in courses using the programs will be compared to historical data in

the same course when the programs were not used. Faculty and students will be surveyed at the beginning and end of the clinical rotation period for perceptions of preparation in related content areas. National Board Scores (mean, S.D., range) in related content and skill areas will also be compared with scores in the same areas in years before the programs were used.

Timetable and Budget:

There are no requests for hardware or software in this proposal.

BUDGET 2003-2004							
Funding Source	Development		Programming		Miscellaneous		Totals
	Use	Amount	Use	Amount	Use	Amount	
TEL	Instructional Designer- Case 1: 20-40 hours	3,000	Case 1: 70-90 hours	5,000	Graphic Designer - Case 1: 40 hours	1,400	10,000
					Material collection, digitizing, copying Case 1	600	
College	Instruction Designer- Case 2: 10-20 hours	1,500	Case 2: 60-75 hours	3,500	Graphic Designer - Case 2: 40 hours	1,400	8,000
					Material collection, digitizing, copying Case 2	600	
					Evaluation survey preparation, data collection and analysis	1,000	
CAPS Dpt	Instructional Designer- Case 3: 20-30 hours	2,000					2,000
Totals		6,500		8,500		5,000	20,000

Roles and Responsibilities:

- Ava M. Trent (Principle Investigator): Coordinate project; Source of concept for interactive design; Solicit faculty and student participants in planning and evaluation groups; Serve as content expert and source of materials for Case 1; Mentor for Case 3
 - Jane Armstrong (Co-Investigator): Content expert and source of materials for Case 2; Mentor for Case 4; participant in development of interactive design
 - Jim Waddell (Co-Investigator): Provide ongoing support (programming) for development and implementation of Cases 2-4 and future cases; participant in development of interactive design
 - Scott Wilson-Barnard (DMC staff member): Performed preliminary analysis and feasibility assessment of interactive design; member of development team
- Additional faculty and students will be included as part of the development and design teams based on the specific case focus and individual interest.

Collegiate and Department Support: This project is consistent with the college's mission to education students in the DVM curriculum to provide continuing high quality health care. This is directly related to Strategic Goal #6 of the College's 2002-2003 Strategic

Plan: Prepare CVM graduates for successful careers and life-long learning. The planned addition of 10 students to the curriculum in the face of decreasing clinical faculty members increases the potential value of TEL tools that can be used to support student learning.