

# Veterinary Emergency Training (VET) Program



## Project Design & Development Plan for Dr. Ed Thompson, DVM

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College of Veterinary Medicine  
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## **Executive Summary**

This proposal is for the design of an online, self-paced, scenario-based eLearning program, the Veterinary Emergency Training (VET) Program. It is being submitted by the instructional designer for consideration to the Vine Veterinary Institute's instructional projects oversight committee and the key project stakeholder, Dr. Ed Thompson.

## **Project Background and Needs**

Fourth year veterinary students at Vine Veterinary Institute (a large college of veterinary medicine in the southwest U.S.) complete a three-week clinical rotation experience focusing on large animal emergency treatment. Due to the unpredictable nature of real-world clinical services, student experiences are inconsistent with respect to their exposure to common large animal clinical cases, clinical procedures, and core emergency topics. Ideally, students should receive a standardized set of experiences that provide practice in addressing and treating common large animal emergency cases, enabling Vine Institute to verify their preparation for practice. The proposed VET web-based interactive, scenario-based program will enable students to synthesize prior learning and use step-wise diagnostic reasoning to problem solve common large animal emergency cases, thus supplementing their clinical rotation experiences and independent study.

## **Learner Analysis**

The target population consists of 92 fourth-year veterinary graduate students, 23 of which have declared their intention to enter large animal practice.

## **Context Analyses**

For those participating in the online Veterinary Emergency Training (VET) program, the performance context is typically be a clinic or large animal veterinary practice through which the learner will perform patient evaluations, diagnoses, procedures, and treatment in the field. The learning context for the VET program is a set of four online, asynchronous and web-based problem-solving scenarios enhanced with multimedia. While the physical features of the VET online learning environment are not an exact match to the physical realities of field veterinary practice, the content and how the problems are presented through the scenarios do align to the performance context.

## **Instructional Goal**

The web-based interactive, case-based Veterinary Emergency Training (VET) program will provide fourth-year Vine Veterinary students with opportunities to synthesize prior learning and to use step-wise diagnostic reasoning to problem solve common large animal emergency cases, thus supplementing their clinical rotation experiences and independent study.

## **Instructional Treatment**

The VET program does not actually teach skills, but instead provides students with the opportunity to synthesize and apply the knowledge and skills they have learned in their academic studies to problem solve emergency situations. Therefore, the identified needs of the learners, the demands of the content (determined through content analysis), and the instructional goal formed the basis of the Instructional Treatment. The SME, Dr. Ed Thompson, reviewed and identified a list of motor, critical thinking, and clinical application skills to be addressed in the scenarios. Appendices for this document list the content classifications used to identify applicable learning outcomes and assessments and strategies aligned to those outcomes. The instructional design is based on both Instructivist and Constructivist pedagogical approaches, drawing from cognitive constructivist and situated learning theories.

## **Media/Technology Plan**

An appendix item details the technologies chosen for delivery and support of the instruction.

## **Implementation and Evaluation Plans**

A detailed schedule, budget, and evaluation plans are included in this plan.

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# Large Animal Veterinary Emergency Training (VET) Program

## I. Introduction

This proposal for the design of an online, self-paced, scenario-based eLearning program, the VET Program, is being submitted by the instructional designer for consideration to the Vine Veterinary Institute's instructional projects oversight committee and the key project stakeholder, Dr. Ed Thompson.

### Project Background and Needs

Professor Ed Thompson is an Assistant Clinical Professor at Vine, college of veterinary medicine in the southwest U.S. that specializes in large animal studies. Dr. Thompson applied for and received a faculty development grant to design a set of interactive teaching scenarios for veterinary students in their final year of study. The scenarios are to be focused on large animal emergency problem solving. Dr. Thompson has named the scenario-based program Veterinary Emergency Training (VET). Elaine Smith is the instructional designer assigned to the project.

#### *Justifying the Need: What Is and What Should Be*

Fourth year veterinary students at Vine Veterinary Institute (a large college of veterinary medicine in the southwest U.S.) complete a three-week clinical rotation experience focusing on large animal emergency treatment. Due to the unpredictable nature of real-world clinical services, the type and frequency of emergency calls received at the clinic where senior veterinary students fulfill their clinical rotations varies widely. As a result, student experiences are inconsistent with respect to their exposure to common large animal clinical cases, clinical procedures, and core emergency topics. Ideally, students should receive a standardized set of experiences that provide practice in addressing and treating common large animal emergency cases, enabling Vine Institute to verify their preparation for practice.

#### *Filling the Gap to Meet the Need*

The proposed VET web-based interactive, scenario-based program will enable students to synthesize prior learning and use step-wise diagnostic reasoning to problem solve common large animal emergency cases, thus supplementing their clinical rotation experiences and independent study. These skills are critical because the urgency of emergency decision making requires knowledge and the ability to apply skills in a setting where the Clinician's resources are often limited. The scenarios will cover a variety of large animal species and topics addressing common medical emergencies presented to veterinarians for four common large animal species: horses, cows, goats, and llamas (camelids). Since the proposed program will be web-based, it will be conveniently available to Vine Institute fourth-year students possessing a reliable high-speed Internet connection at their preferred time and location. As a result, the VET program will meet the need of fourth-year Vine Veterinary students for opportunities to work through field-relevant, large animal scenarios in a low-consequence, simulated environment.

## Learner Analysis

The initial activities required for this project involved the collection of data and analysis of the target learner population for the VET program, a series of online veterinary medical scenarios on the emergency treatment of four large animal species (equine, bovine, caprine, and camelid species). The target population consists of 92 fourth-year veterinary graduate students, 23 of which have declared their intention to enter large animal practice.

Students are typically assigned to a three-week large animal clinical rotation in the fall of their final year; the third of three clinical experiences during that academic year. Clinical rotations can provide valuable, authentic experiences of veterinary practice for students under the mentorship of a practicing veterinarian. Unfortunately, due to the unpredictable nature of real-world practice, the clinical rotation cycles do not provide a consistent experience for all students. Therefore, the clinical faculty requested the development of a series of online veterinary medical scenarios that would provide all students with the opportunity to problem solve cases that featured the most common ailments afflicting these large animal species.

To compile the learner profile, the designer collected data to complete Table 1, including program admissions data, retention and graduation rates, end-of-course exam grades, clinical rotation ratings and evaluations, and other applicable data. Table 1 provides information to justify the design decisions provided in this proposal, listing data on the target learner characteristics and needs, and the implications of that data for the design of the veterinary scenarios.

**TABLE 1 – VET Learner Characteristics and Design Implications**

CHARACTERISTICS	IMPLICATIONS FOR DESIGN
<b>DEMOGRAPHIC AND GROUP DATA</b>	
<ul style="list-style-type: none"> <li>• 4<sup>th</sup> year, veterinary graduate students (n = 92). Specializations: 23 in large animal practice, 69 in small and lab animal practice and public health.</li> <li>• Age: 21-35. Avg. age at program entry: 24.</li> <li>• 80% female, 20% male.</li> <li>• Graduate level.</li> <li>• 89 students from 11 U.S. states and Puerto Rico; two international students from Canada and Mexico.</li> <li>• 11 students are from rural areas: farms or small towns with populations &lt; 1,000.</li> </ul>	<ul style="list-style-type: none"> <li>• Diversity and range of characteristics will impact content treatment, delivery mode, and amount of learner choice in the instruction.</li> <li>• Due to the familiarity of a portion of the audience with the context of the scenarios, the content must be realistic and should therefore be reviewed by SMEs prior to testing.</li> <li>• Scenarios will use the reading level and vocabulary used in the students' previous coursework.</li> <li>• Since students assigned the scenarios will have completed their third year of veterinary medical studies, they are assumed to be familiar with 95-99% of the content used in the scenarios.</li> <li>• Learner location and time zone will not be an issue since the scenarios will be delivered as self-paced, asynchronous instruction.</li> </ul>
<b>PHYSIOLOGICAL CHARACTERISTICS</b>	
<ul style="list-style-type: none"> <li>• Unknown – none of the students have registered with Student Disability Services (SDS).</li> </ul>	<ul style="list-style-type: none"> <li>• Any accessibility issues will be addressed by designing to comply with applicable legislation for individuals with disabilities.</li> <li>• The instructional design will feature adequate color contrast, closed captions and audio descriptions, alternate text for images, and the capability for tabbing through the scenarios with a keyboard.</li> </ul>
<b>COGNITIVE ABILITIES</b>	
<ul style="list-style-type: none"> <li>• All students in their 4th year of the Vet Med program have the cognitive ability to handle online coursework.</li> <li>• Average GPA = 3.2.</li> <li>• The reading level, verbal and mathematical abilities are at level.</li> </ul>	<ul style="list-style-type: none"> <li>• Since the performance of students in the 4th year of the program are generally successful in their academic efforts, it can be assumed that they will be able to successfully complete the scenarios if designed with some of the recommended design features including:</li> <li>• Scenarios will scaffold students with fully- to partially-worked examples, to assessment items; analogies; learner-controlled pacing</li> </ul>



CHARACTERISTICS	IMPLICATIONS FOR DESIGN
<ul style="list-style-type: none"> <li>• Faculty report that graduate student attention and focus is sufficient to complete problem-solving scenarios.</li> <li>• To date, no students have registered with SDS as having a learning disability.</li> </ul>	<ul style="list-style-type: none"> <li>and time to complete; and adequate practice opportunities to enable learners to score at least an 85% on the assessments.</li> <li>• Each scenario will be targeted at a length of 20 minutes to maintain average attention spans and focusing ability. Content will be chunked into segments that each address just one concept.</li> </ul>
<b>PRIOR KNOWLEDGE</b>	
<ul style="list-style-type: none"> <li>• 11 students grew up on farms or in rural areas (from 20-22 average years of experience with large animal patients); all students have similar levels of declarative and procedural knowledge from the previous three years of the program.</li> <li>• All students have three years of experience in diagnostic and clinical reasoning.</li> <li>• All students in the program have experience with online instruction.</li> </ul>	<ul style="list-style-type: none"> <li>• Content treatment is geared to the prior knowledge of the majority of students, who did not grow up on a farm or in a rural area. No pretest will be used to ascertain prior knowledge variation because this would compromise measurement of the instructional effects.</li> <li>• Scenarios will build on prior knowledge by incorporating brief assessments on essential knowledge that students should recall from memory from earlier studies.</li> <li>• Reference source access and procedural videos will provide scaffolding for scenario information to be recognized rather than recalled and for information from optional coursework.</li> <li>• Students are familiar with the self-paced asynchronous format.</li> </ul>
<b>MOTIVATIONS AND OTHER AFFECTIVE CHARACTERISTICS</b>	
<ul style="list-style-type: none"> <li>• Vet Med students are motivated to do well on instruction that aligns to their future career goals.</li> <li>• Students have a good attitude toward both the Vet Med College and the topic of instruction (as gleaned from course survey data and anecdotal reports). They attribute their success to ability and effort.</li> </ul>	<ul style="list-style-type: none"> <li>• The scenarios will engage students in problem solving relevant to their perceived needs in their future profession.</li> <li>• Since the learners appear to have a good attitude toward the instruction and its sponsor, reinforcement and feedback will consist of knowledge of results and detailed explanations to increase learner understanding of accurate diagnostic reasoning and actions. The self-rewarding value of success in problem-solving activities is assumed to provide sufficient motivation for learners.</li> </ul>

## Context Analyses

### Performance Context

For those participating in the online Veterinary Emergency Training (VET) program, the performance context is the environment where the learners will eventually use the knowledge, skills, and attitudes that they practice in the scenario-based instruction. That real-world, final performance context will typically be a clinic or large animal veterinary practice through which the learner will perform patient evaluations, diagnoses, procedures, and treatment in the field. As practicing large animal veterinarians, these learners will be expected to synthesize the knowledge, skills, and attitudes they have learned while at the university, and to use it to problem solve using step-wise diagnostic and clinical reasoning.

### Learning Context

The learning context for the VET program is a set of four online, asynchronous and web-based problem-solving scenarios enhanced with multimedia. Research shows that close alignment of the learning and performance contexts facilitates the transfer of learned knowledge and skills to new situations (Dolmans, De Grave, Wolfhagen, & Van Der Vleuten, 2005). In addition, knowledge is embedded in the context in which it is used; therefore, authentic tasks and meaningful, realistic settings best facilitate learning (Duffy & Cunningham, 1996). While the physical features of the VET online learning environment are not an exact match to the physical realities of field veterinary practice, the content and how the problems are presented through the scenarios do align to the performance context.

For example, the VET program is designed to expose learners to professionally relevant contexts and confront them with problems requiring them to recall and synthesize the knowledge and skills they have accumulated over the course of their years of study. They must apply the knowledge and skills using the same step-wise diagnostic problem-solving process they will use as practitioners. Thus, the learning assessments authentically reflect the knowledge to be recalled, the decisions to be made, and the skills to be applied in the targeted performance context.

An accurate, empirical appraisal of the success of the alignment between the learning and performance contexts would be difficult due to the variation in the prior knowledge and experience of students entering large animal veterinary medical programs. Some students grow up on farms or have prior work experience in clinical settings, while others have very little prior experience problem solving large animal health issues. Therefore, the best evaluation measure to use in determining the success of the alignment between the learning and performance contexts would consist of self-report data from students concerning their level of confidence in their problem-solving abilities before and after completing the VET scenarios. This data could also be collected once participants graduate and enter full-time veterinary practice.

### **Cultural Context**

As can be seen from the above learner analysis, Vine veterinary students are typically very familiar with the social culture of both this country and the domestic farming community in which they will practice following graduation. While there are one or two international students enrolled in the program each year, the faculty and student body at Vine take great care to ensure that those students are assimilated and understand the cultural context of all activities and learning events at Vine. Faculty also explicitly ask the international students to provide detailed descriptions of the context of their future practice in their own country, and encourage them to point differences they note in context and practice during learning experiences, for the benefit of Vine faculty and students alike.

With respect to organizational culture, the administration, faculty, and students at Vine Veterinary Institute explicitly talk about and share their thoughts on a shared vision for professional veterinary practice that meets the needs and expectations of clients. There is a sense of shared ownership in the change process involved in keeping up with changes in demand and in procedures, in keeping abreast of what educational competitors are doing, and in producing the best practitioners in the veterinary medicine profession. The scenarios make reference to the standards promoted by the Vine institutional culture and seek to reinforce them at every opportunity.

### **Constraints and Resources**

The primary project constraint is that of the schedule. All hours and money spent on the project must be completed by the end of the fall semester, 2020.

The resources provided to the grant recipient include the services of an instructional designer/developer, a videographer, and a graphic artist.

### **Instructional Goal**

The web-based interactive, case-based Veterinary Emergency Training (VET) program will provide fourth-year Vine Veterinary students with opportunities to synthesize prior learning and to use step-wise diagnostic reasoning to problem solve common large animal emergency cases, thus supplementing their clinical rotation experiences and independent study.

## II. Instructional Treatment

This section includes a summary of the content and its progression (with references to additional items in the appendices), the theoretical and pedagogical bases for the instruction, the factors influencing the content treatment, and the structure, progression, and elements to be included in the instruction (i.e., the instructional strategies, assessments, and technologies included in the design).

### Content Analysis

The VET case study program was initiated to provide fourth year veterinary students with practice in clinical reasoning and diagnostic problem-solving beyond what program administrators could guarantee that students would receive, considering the unpredictable nature of clinical rotation opportunities. As a result of this focus, the VET program does not actually teach skills, but instead provides students with the opportunity to synthesize and apply the knowledge and skills they have learned in their academic studies to problem solve emergency situations. Yet, due to recent changes in degree requirements, some of the students completing the VET program will not have learned all the skills and knowledge for which the cases provide practice opportunities. To address this inequity, the VET program has been designed to track student problem-solving decisions. If a student's decisions indicate that their grasp of required skills and knowledge is inadequate, the program will direct the student to remediation.

The individual acting as subject matter expert (SME) for the project is Dr. Ed Thompson. Dr. Thompson has identified the skills and knowledge that should be remediated. Beginning with a set of skills and tasks from the American Veterinary Medical Association's (AVMA) list of *Essential and Recommended Skills for Veterinary Technicians*, which included motor, critical thinking, and clinical application skills, Dr. Thompson marked each task as: Train, No Train, or Continually Train (defined below). See Table 2 to view a portion of those skills and Dr. Thompson's ratings.

#### Train

Task or skill is required on the AVMA's list of Essential and Recommended Skills. Improper performance of the skill by a veterinarian has the potential to impact the health of the patient, seriously damage the confidence of a client in the veterinarian's ability to effectively treat the patient, and/or damage the veterinarian's authority with veterinary technicians or others on the clinical staff. A single learning opportunity is typically sufficient for task mastery.

#### No Train

Task or skill either has a low difficulty rating or there is low probability of error when it is performed, and it can therefore easily be performed when necessary with the use of a job aid. Improper performance may also be judged to have low impact potential. Skill can be competently performed with the use of a job aid or through coached experience, when available.

#### Continually Train

Task or skill is either extremely complex, variable, or is so infrequently carried out that the clinician may forget how to perform the procedure (or a combination). The task is typically performed during non-routine or emergency conditions and proper task performance is critical to the well-being of the patient. There may also be risks to the safety of the clinician or others attending the patient if the task is incorrectly performed. Therefore, periodic and regular training on the skill is recommended to maintain proficiency.



**TABLE 2 – Task Training Decisions**

TASK/SKILL	TRAIN	NO TRAIN	CONTINUALLY TRAIN
<i>Administer enteral medication via oral speculum and stomach tube (ruminants) and nasogastric intubation (horse, pony, donkey, mule)</i>	*		
<i>Perform first aid and cardiopulmonary resuscitation</i>			*
<i>Perform jugular venipuncture (horse, pony, donkey, mule, ruminant)</i>	*		
<i>Load large animals</i>		*	
<i>Apply a restraining twitch (horse, pony, donkey, mule)</i>	*		
<i>Safely operate a variety of cattle chutes</i>			*
<i>Obtain accurate patient temperature, pulse, respiration, auscultate heart/lungs (for horse, pony, donkey, mule, cow, camelid, goat, sheep)</i>	*		
<i>Assess hydration status</i>		*	
<i>Collect urine sample by catheterizing large animal</i>	*		
<i>Trim hooves of ruminant, horse, pony, donkey, mule</i>		*	
<i>Apply equine tail and leg wraps</i>	*		
<i>Identify common grains and forages</i>	*		
<i>Identify elements in the patient's environment and in or on the patient that can result in toxicity, including common poisonous plants and other organic and inorganic substances</i>			
<i>Dentistry: float teeth on equine patients</i>		*	
<i>Properly operate and administer treatment using a defibrillator</i>			*

**Progression of the Instruction**

An eLearning format for the progression of problem-solving steps for the cases was also developed. This progression mirrored and elaborated on the diagnosis and treatment process that veterinarians carry out in real-world practice. The step-wise diagnosis and treatment process carried out by veterinarians is illustrated in Figure 1. The content was analyzed to produce a consistent structure for the progression of the cases and the eLearning format with a progression of problem-solving steps designed to reflect that process is included in Appendix B.

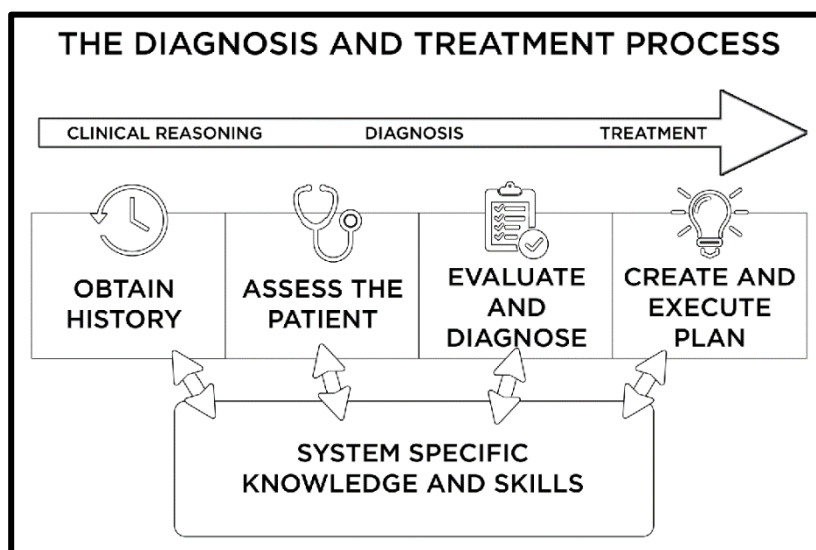


Figure 1. The veterinary diagnosis and treatment process.

### Resulting Content Analysis Components

The full content analysis components include lists of applicable tasks and sub-tasks, descriptions of physical exam parameters for different large animal species, lists of diagnostic tests and the parameters for what constitutes appropriate application of those tests, and normal and abnormal results that can be expected and the implications of those results. In addition, the results of the content analysis yielded:

- lists of applicable tasks and sub-tasks;
- descriptions of physical exam parameters for different large animal species;
- lists of diagnostic tests and the parameters for what constitutes appropriate application of those tests;
- normal and abnormal results that can be expected and the implications of those results;
- detailed procedures for the diagnostic tests and how specific pieces of equipment should be used to collect data from patients;
- tables of medications with proper dosage amounts for specific conditions and specifies; and
- common sources of toxicity in large animal species; treatment options for various ailments; and more.

All this data was analyzed for meaning and common themes across the cases were identified to produce a list of aligned outcomes, assessments, instructional strategies, and supporting technologies (see Appendix A). A representative sampling of the content is included in this report, and is laid it out in easy-to-read charts, graphs, and tables, with check boxes and table categories that enables reviewers to quickly confirm or correct the analysis results. For example, the instructional designer and the SME worked together to develop a series of fishbone diagrams for the VET case studies. Fishbone diagrams, or cause-and-effect diagrams, provide “a simple method of mapping causes of problems and show factors that will predict success in the problem space” (Dabbagh, Marra, & Howland, 2019, p. 142). Figure 2 illustrates a fishbone diagram for causes of equine colic.

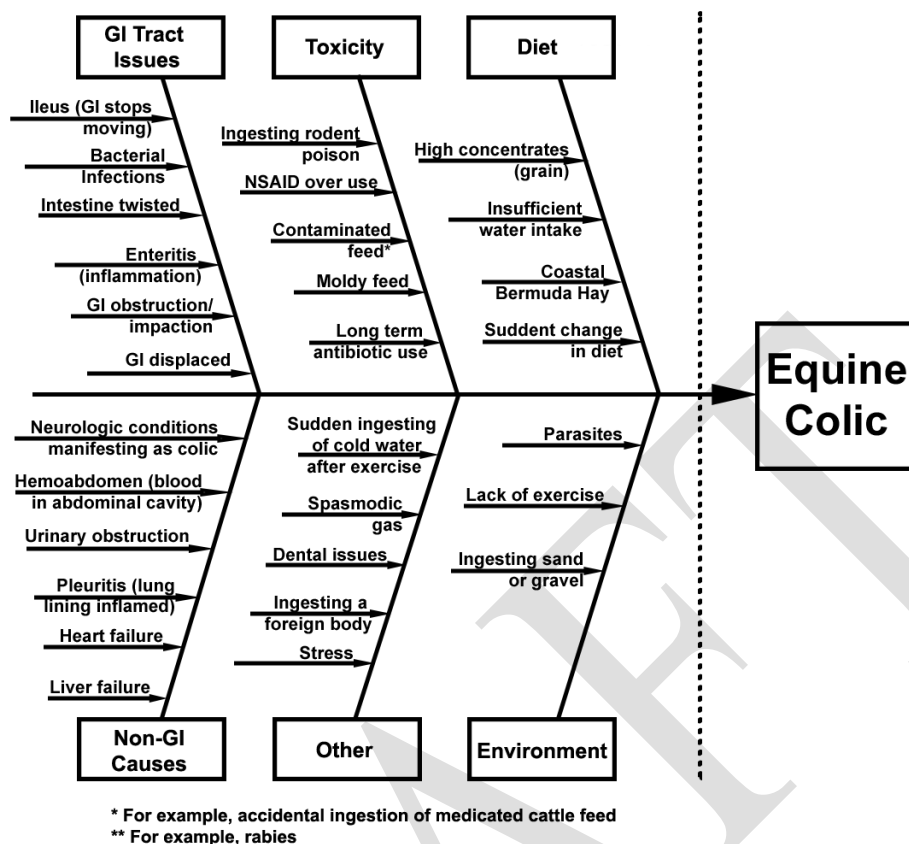


Figure 2. Fishbone diagram for equine colic.

## Pedagogical and Theoretical Analysis

The VET case study program was initiated to provide fourth year veterinary students with practice in clinical reasoning and diagnostic problem-solving beyond what program administrators could guarantee that students would receive, considering the unpredictable nature of clinical rotation opportunities.

Problem-solving and clinical diagnosis activities are primarily ill-structured and context-driven. This points to a primarily Constructivist pedagogical approach that draws from cognitive constructivist and situational learning theories. However, much of the content that students apply in the problem-solving carried out in these cases is taught through traditional Instructivist course work and therefore the brief assessments included throughout the cases are Instructivist in nature. Finally, preparation for veterinary students involves making them aware of both human and non-human expert resources available for consultation during practice. Therefore, the cases include access links to medical references and resources that scaffold and support veterinaries during emergency practice.

## Factors Impacting Content Treatment

Several factors influenced the decisions on content treatment, including the needs of the learners, the demands of the content, and the instructional goal of the project.

### Needs of the learners

To prepare them for the demands of the future performance context within which they will be operating, fourth-year Vine Veterinary students are provided with rich, yet demanding, course and clinical rotation schedules. The problem-solving cases must be web-based **and** flexible in nature so that the students can

practice problem-solving whenever (and wherever) they can fit it into their busy schedules. Featuring the common ailments of four large animal species will provide consistency to what the students experience overall, filling in the gaps that can occur as a result of unpredictable clinical rotation assignments.

Due to the fact that students often access this type of enrichment activity between clinical assignments or classes, the case material needs to be mindfully “chunked” to allow students to consume it in bite-sized bits, and it must provide the option to resume where the student left off previously. Content will be chunked into segments that each address just one concept. Each scenario will be targeted for a length of  $\leq 20$  minutes to maintain average attention spans and focusing ability. Future practice responsibilities are often carried out in the field. The cases should mirror the challenges, conditions, and opportunities characteristics of field clinical service as much as is possible.

### ***Demands of the content***

The diagnostic process carried out by veterinary students is a complex problem-solving process that they learn explicitly early in their academic career, and practically through their clinical experiences. This is situational knowledge that is typically practiced and assessed during their clinical rotations, but when completing the online cases, students will be assessed on their reasoning logic, as gauged through their choices of differentials, diagnostic tests and exams, and treatments.

The majority of the content that students use foundationally as they work through the cases is of a declarative and procedural nature. The format of the cases will require that students recall some of this material from memory. Other content must merely be recognized or recalled with an aid. In addition to remembering this content, students will be required to work through most all of the other levels of Bloom’s revised cognitive thinking skills taxonomy. They must remember and understand the content to complete the cases. They must then gather data on the patient’s history and condition, applying declarative and procedural knowledge from their studies and analyzing patient vital signs and symptoms to assess the patient’s condition. They then evaluate exam and test results to produce a diagnosis, and then they create a treatment plan that synthesizes their learning and problem-solving efforts. The proposed instruction must therefore be designed to provide some content in the form of job aids and access to veterinary reference works (specifically, content that does not need to be recalled from memory). Content that should be recalled from memory will be the subject of brief assessments distributed throughout the cases in a manner that reflects how the student would be required to retrieve and utilize that information during the course of real-world veterinary practice.

The message design factors chosen to meet the demands of the content reflect elements of form and flow that support the function, or main purpose and strategies identified for the instruction. Table 3 provides a sample of the form and flow factors, and the media attributes that will be used to address the function of the message and produce effective instruction that is successful in communicating the content. Detailed multimedia specifications are included in Appendix C.

**TABLE 3 – VET Sample of Design Principles, Form Factors, and Media Attributes Used**

PRINCIPLES TO ADDRESS	RELATED FORM FACTORS (PRESENTATION & FLOW)	POSSIBLE MEDIA ATTRIBUTES TO ADDRESS FORM FACTORS
To eliminate needless mental effort: Allow processing time. Offer appropriate control.	Will allow learner to control the pace of the instruction to allow for variable processing time for different learners. Learner control will also enable the learner to go back to review content and the previous selections they made during the instruction.	Accomplished by setting the eLearning slides to advance upon the command of the learner, using previous and next buttons to do so (i.e., no automatic advancing of the slides). Custom slide tabs will be included to enable the learner to easily return to summary slides to review content and their previous choices.
To make content easier to understand:  Chunk content.	Progressive slides and layers in the eLearning program that are linked via Next and Previous buttons.	Will use an eLearning authoring program and its ability to facilitate chunking of content through progressive slide layout, layers, buttons and action triggers, and branching capabilities.

To make content easier to understand:  Add advance organizers.	Will use objectives and focusing questions, and menu slide layouts to inform learners of the content to be covered and the desired learning outcomes.	
To make content easier to understand:  Support memory.	Will provide job aids, checklists, and access to veterinary medical reference works via the library login.	
To make content easier to understand:  Focus attention.	Will use cueing to convey meaning, provide emphasis, and provide feedback.	
To build deeper understanding: Supply missing knowledge. Check and fix understanding.	Will use realism (photos and videos) and highlighting (cueing) to provide examples and non-examples of symptoms and procedures to ensure that learners are aware of key characteristics and common potential misconceptions essential for accurate diagnoses.	

### ***Project instructional goal***

The instructional goal for the project, as stated previously, also influences design decisions on the treatment of the content. To reiterate, the goal is:

The web-based interactive, case-based Veterinary Emergency Training (VET) program will provide fourth-year Vine Veterinary students with opportunities to synthesize prior learning and to use step-wise diagnostic reasoning to problem solve common large animal emergency cases, thus supplementing their clinical rotation experiences and independent study.

The goal reflects the wishes of the client and as such, it provides justification and guidelines on instructional delivery mode, project scope, and overall purpose of the instruction.

## **III. Implementation and Evaluation Plan**

This section addresses the proposed plans for implementation and evaluation of the instruction. The evaluation of the instruction will be carried out throughout the life of the project, from analysis through implementation.

### **Implementation Plan**

A pilot test of the VET case study program will be implemented with a cohort of learners via the institution's Learning Management System (LMS). This will provide an opportunity to formatively test and summatively evaluate the implementation program internally, prior to deploying online. A schedule and estimate of project hours follows. The final date for deployment of the pilot test will be January 7th. Table 4 provides a summary of the implementation considerations.



**TABLE 4 – VET Implementation Considerations**

VET RESOURCE ESTIMATES			
Project Tasks:		Person Hour Estimates:	
Project Planning/Meetings		40 hours	
Outlines, Scripts, Prototypes		80 hours	
Specific Scenario Development (4 scenarios)		160 hours	
Training and Training Materials Development for Client on Articulate Storyline (to accomplish sustainability of project)		32 hours	
Graphic Artist, Template Development and Images		40 hours	
Videographer to record and edit 6 videos.		83 hours	
Product Testing, Evaluation, Revisions (hours for multiple people)		40 hours	
Total OIT person hour estimate:		475 hours (over 26 weeks)	
VET PROJECT SCHEDULE			
Milestone/Deliverable	Responsible Party	Proposed Due Date	Completed
Draft design plan	Instructional Designer	6/21	x
Horse video 1 ready for review	Videographer	6/21	x
Review of horse video 1 complete	Instructional Designer / Client	7-5	x
Design plan reviewed	Client	7-5	x
Horse video 2 ready for review	Videographer	7-5	x
Horse video 2 reviewed	Instructional Designer / Client		x
Prototype Horse scenario ready for review	Instructional Designer	7-6	x
Review of prototype Horse scenario done	Client	7-20	x
Internal review and testing of Horse prototype scenario (look and feel, design/functionality, usability, accessibility, and quality control)	Graphic artist / Internal Reviewer / Others on the design/development team	7-20	x
Revisions made to Horse scenario	Instructional Designer	7-25	x
Goat scenario ready for review	Instructional Designer	9-7	
Internal review and testing of Goat scenario (look and feel, design/functionality, usability, accessibility, and quality control)	Graphic artist / Internal Reviewer / Others on the design/development team Client-identified Student tester	9-21	
Client review of Goat scenario complete	Client	9-21	
Revisions made to Goat scenario	Instructional Designer	9-28	
Camelid scenario ready for review	Instructional Designer	10-19	
Camelid video(s) ready for review	Videographer		
Internal review and testing of Camelid scenario (look and feel, design/functionality, usability, accessibility, and quality control)	Graphic artist / Internal Reviewer / Other OIT reviewer Client-identified Student tester	11-2	

VET RESOURCE ESTIMATES			
Project Tasks:		Person Hour Estimates:	
Review of Camelid scenario complete	Client	11-2	
Review of Camelid video complete	Client / Instructional Designer	11-2	
Revisions made to Camelid scenario	Instructional Designer	11-9	
Cow scenario ready for review	Instructional Designer	11-16	
Cow video(s) ready for review	Videographer		
Internal review and testing of Cow scenario (look and feel, design/functionality, usability, accessibility, and quality control)	Graphic artist / Internal Reviewer / Other OIT reviewer Client-identified Student tester	11-30	
Review of Cow scenario complete	Client	11-30	
Review of Cow video(s) complete	Instructional Designer Client	11-30	
Revisions made to Cow scenario	Instructional Designer	12-4	
Presentation of final version to Client	Instructional Designer	12-6	
Evaluative feedback on training materials	Client	12-7	
Final revisions complete	Instructional Designer	12-13	
Deployment	Instructional Designer / Client	12-14	
Training and Training materials developed for the client with Articulate Storyline 3	Instructional Designer	12-14	

## Evaluation Plan

Formative review and testing for the project will be carried out by the Client (who is also the subject matter expert, or SME), by internal design team members, and by one or more students who are representative of the target audience (as recommended by the Client). SME reviews will focus on the accuracy of the content and the logic flow of the case studies. Internal reviews and testing of each scenario will focus on usability, accessibility, quality control, and *look and feel* (or the design and functionality) of the cases.

The key questions to be answered by the project evaluation include:

- Is the instructional content accurate, complete, and realistic to provide sufficient authentic opportunities for participants to practice problem solving and clinical diagnostic reasoningskills?
- Is the VET program engaging and motivating for the target audience?
- Is the VET program content effective in fostering learning and problem solving and increasing the confidence of veterinary medical students?
- Will participating students transfer the clinical and diagnostic skills honed through participation in the VET program to professional practice? Will they credit the VET program with their skills and confidence?
- Will participation in the VET case studies program impact final student class rankings, and by extension, future job offers or job placements?

Kirkpatrick's four-level evaluation model was used in identifying summative measures and some formative measures to ensure quality and judge the effectiveness of the VET program. These measures are outlined in Table 5, which follows.

**TABLE 5 – VET Program Evaluation (using Kirkpatrick's Levels)**

KIRKPATRICK LEVEL	DESCRIPTION	MEASURES TO IMPLEMENT
<b>LEVEL 1: REACTION</b>	This level of evaluation gauges the learners' satisfaction with, and reaction to, the training.	This level will be measured formatively with "talk-aloud" protocols and surveys during usability tests of the prototype. It will be measured summatively by the Client.
<b>LEVEL 2: LEARNING</b>	This level ascertains the success of the learning materials through the results of user knowledge assessments.	This level will be measured through the analysis of learner results on the assessment questions that accompany the scenarios and the ultimate success/failure of the learner to accurately diagnose and treat the patient in each scenario. The Client may at some point also use an instrument to pretest and post-test learner confidence.
<b>LEVEL 3: TRANSFER/ BEHAVIOR</b>	This level determines whether learners are actually using the acquired knowledge and skills in a future job, or in future university experiences requiring the application of problem-solving skills and clinical and diagnostic reasoning (e.g., in clinical situations or in the next course requiring those skills). This should indicate the transferability of the VET training to professional practice.	The quality of participating students' use of clinical and diagnostic reasoning on the job and in future clinical and course experiences will be ascertained by the Client. This will be done either through measures administered prior to graduation, or by contacting future employers of former students three-to-six months following graduation, to inquire as to the quality of those former students' clinical and diagnostic skills. At the same time, former students will be given the opportunity to provide their impressions of the contributions that the VET program made to their readiness for the use of clinical and diagnostic reasoning in professional practice.
<b>LEVEL 4: IMPACT/ RESULTS</b>	This level determines the long-term organizational results and impact of the VET program on the large animal program at college, in terms of reputation, successful job placements, and subsequent future enrollment.	This level will likely not be measured due to the number of additional variables that could complicate isolation of the effects of the VET program. However, the Client may decide to compare final examination score and clinical performance score averages of participating and non-participating VET program students to determine if completion of the case studies indicate impacts regarding final student class rankings, and by extension, job offers or job placement.

## Conclusion

To conclude, this proposed instruction has been designed in response to the need communicated by the client, Vine Veterinary Institute, and the primary stakeholder, Dr. Ed Thompson. The proposed plan contained in this document is designed to meet the overall goal and needs of the target audience. The design team welcomes the comments of the reviewers. Please use the contact information provided in the cover email.

## Appendix A – Program and Scenario Objectives, Assessments, and Strategies

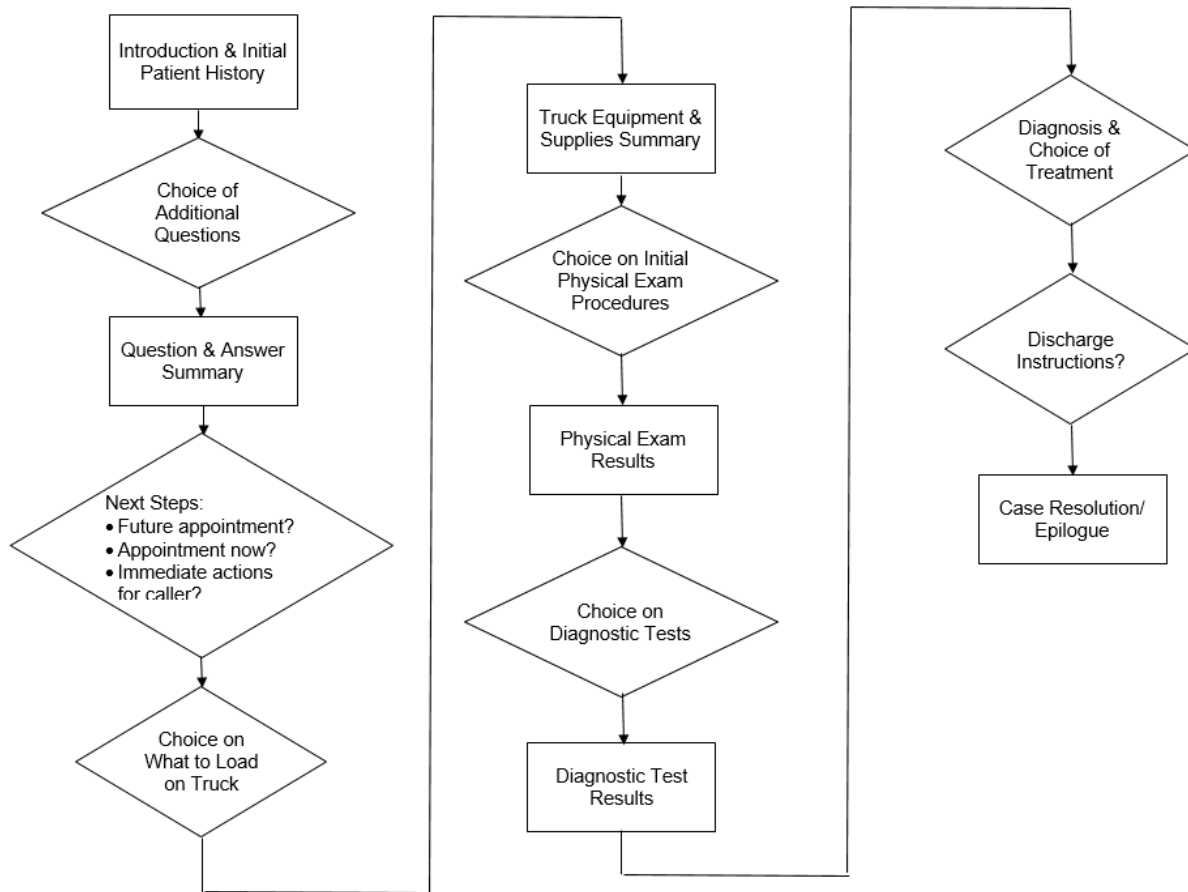
*In this VET equine case study, you will recall and apply key facts, procedures, and skills learned during your previous course work and clinical experiences, and use appropriate problem-solving skills and clinical and diagnostic reasoning to...*

LEARNING OUTCOMES	ASSESSMENTS	TEACHING and LEARNING STRATEGIES	TECHNOLOGIES
Determine the necessity for hands-on evaluation and treatment of an equine patient versus phone consultation.	<b>Formative:</b> The equine case study provides choices on questions that the learner can ask to obtain information about the case. If the learner does not ask certain key questions, they are remediated and directed to ask the questions to obtain an accurate diagnosis.	The case study provides practice in obtaining a patient history. The learner can choose from up to nine questions to ask the client, obtaining answers that allow for a quick phone-based patient assessment. If the learner does not ask certain key questions, s/he is directed to ask the questions and provided with an explanation as to why that information is critical to an accurate diagnosis.	<ul style="list-style-type: none"> <li>• Development: Articulate Storyline eLearning software, with choices and branching.</li> <li>• Delivery: Publish for both LMS and web delivery.</li> </ul>
Recall normal equine physical exam parameters from memory.	<b>Formative:</b> The learner is provided with the patient's physical exam results for respiratory rate, temperature, gut sounds, lung auscultation, and heart rate. The learner is then asked whether these results are in the normal range for a horse of this age, requiring the recall from memory of this critical foundational information.	The learner is provided with an opportunity to listen to and calculate the patient's heart rate. A scaffold is provided in the form of optional instructions on how to calculate the heart rate. Prior to being asked an assessment question on normal equine physical parameters, learners are provided with an optional link to reference resource materials that provide the normal parameters for equine respiratory rate, temperature, gut sounds, lung auscultation, and heart rate.	Embed multimedia elements within the Storyline file and add optional buttons to access help resources, as well as a link to library reference resources. Use formats that allow for interaction with the content.
Recognize appropriate sedation drugs and dosages for horses.	<b>Formative:</b> Several times during the course of the case the learner is assessed on knowledge of the appropriate medication and dosage for sedation, pain relief, and treatment for inflammation and other conditions. Assessment questions are provided in a variety of formats. Multiple choice formats are used for information that must be recognized rather than recalled from memory.	Throughout the case, learners are provided with access to optional reference resources on appropriate medications and dosages for equine sedation, pain relief, and treatment for inflammation and other conditions. Formative assessment questions prompt learners to determine this type of information or consult the resources.	Use a variety of question formats within Storyline to prompt and test learner recall of foundational knowledge required for diagnostic procedures and effective treatments. Use multiple choice for information to be recognized.

LEARNING OUTCOMES	ASSESSMENTS	TEACHING and LEARNING STRATEGIES	TECHNOLOGIES
Evaluate and distinguish between inadequate and inappropriate versus thorough and appropriate discharge instructions for the equine case presented.	<p><b>Formative:</b> At the close of the case, the learner is presented with a choice of treatment options in multiple choice question format. If the learner selects an inappropriate response, the rationale is provided, and they are given multiple opportunities to try again. Following a treatment decision, the learner selects between three versions of discharge instructions to leave with the client. Again, if the best option is not selected first, learners can try again and are provided with the rationale for the best option.</p> <p><b>Summative:</b> At the close of their clinical experiences and after completing the cases, the participating students complete a knowledge-based examination that covers the same material as a pretest administered prior to their completion of the cases. They also retake a confidence survey that was administered prior to their completion of the cases.</p>	<p>At the close of the case, the learner is presented with a choice of treatment options in multiple choice question format. If the learner selects an inappropriate response, the rationale is explained, and they are given multiple opportunities to try again so that they completely understand why the best choice is optimal. Since medical practice is not an exact science, this sort of trial and error practice provides students with the opportunity to make mistakes (or less-optimal choices) in a low-stakes environment.</p> <p>Following a treatment decision, the learner selects between three versions of discharge instructions to leave with the client. These include instructions for feed and hay rations, water, exercise, future follow up actions, and symptoms that merit a call to the veterinarian. If the best option is not selected first, learners can try again and are provided with the rationale for the best option.</p>	<p>Use multiple choice question formats to test recognition of appropriate treatments and discharge instructions.</p> <p>Learning analytics for individual assessment items will be collected and reported to the LMS by the Storyline case version published for LMS delivery. These will be analyzed to evaluate the effectiveness of specific content instruction for the overall veterinary program. For participants at the original institution, the summative assessment and confidence survey are administered through questions in the LMS. Web participants will not be summatively assessed.</p>



## Appendix B – eLearning Format for the Case Progression of the VET Scenarios



## Appendix C – Multimedia Specifications

Multimedia Specifications	Dr. Ed Thompson, DVM, Assistant Clinical Professor in the Vine Veterinary Institute College of Veterinary Medicine	
Client, project title, & deadlines:	Veterinary Emergency Training (VET) December 14, 2020	
Learner audience description:	Veterinary students enrolled in their final year of training, approximately 90-100 students annually. If the training is eventually deployed via an outward-facing website, a secondary global audience will consist of those individuals who choose to access it via the web.	
Content summary & Course purpose:	Due to the unpredictable nature of the type and frequency of calls received during a student's two-week long clinical rotations, student exposure to common large animal clinical scenarios, procedures and core topics varies greatly. The VET web-based interactive, scenario-based program will enable students to synthesize prior learning and use step-wise diagnostic reasoning to problem solve these common large animal scenarios, thus supplementing their clinical rotation experiences and independent study.	
Learning context & Delivery mode(s):	The VET program will be web-based and self-paced. It will be developed in Articulate Storyline 360 to include interactive elements and multimedia.	
Instructional scope/ organization:	The program will consist of four scenarios: "colic" (abdominal pain) in horses, intestinal parasitism in goats, neurologic disease in llamas, and metabolic disorders in dairy cattle. Without knowing the diagnosis, learners select the desired species scenario from the VET Home page.	
Deliverables:	<ul style="list-style-type: none"> <li>× Web-based scenario presentation</li> <li><input type="checkbox"/> Downloadable and printable workbook</li> <li>× Additional resources (e.g., library access to resources)</li> <li><input type="checkbox"/> Instructor Guide</li> <li><input type="checkbox"/> Other: _____</li> </ul>	
Visuals:	Existing visuals Client wants to use:	Institutional logo, photos, and videos provided.
	Starting point existing visuals:	Certificate of completion, visuals from provided, existing, public domain websites.
	Key concepts to convey visually:	Motifs for horse, goat, camelid, and cow.
	Major visuals or layouts required: (indicate if concept sketch is required and whether it is an illustration or icon)	Template for development software. Home page visual of all four species (photos supplied from stock photo account and selected by client).
Multimedia Elements:	Videos shot on location at the university farm. Client facilitates. Client has obtained permission to use an animation for one of the videos produced by another university.	
Template set:	<ul style="list-style-type: none"> <li>× Title slide</li> <li>× Section/Module Introduction slide (scenario introduction slide)</li> <li><input type="checkbox"/> Learning objectives slide</li> <li><input type="checkbox"/> Section/Module Summary slide</li> <li>× Main Content Topic slide</li> <li><input type="checkbox"/> Sub-topic slide</li> <li><input type="checkbox"/> Slide layer</li> </ul>	

	<ul style="list-style-type: none"> <li><input type="checkbox"/> Multimedia slide</li> <li><input type="checkbox"/> Knowledge check slide (quiz slide)</li> <li><input type="checkbox"/> Activity/Interaction/Discussion Slide (for instructor-led)</li> <li><input type="checkbox"/> “Course Submission” slide</li> <li><input type="checkbox"/> “Contact” slide</li> <li><input type="checkbox"/> “Navigational Instructions” slide</li> <li>× Other: Resources slide layout</li> </ul>
Instructional Designer comments:	<ul style="list-style-type: none"> <li>× Theme – common emergency scenarios in veterinarian practice for horses, cows, goats, and camelids</li> <li>× Tone – professional but not heavy; some light humor</li> <li>× Iconography – for decision points, for truck summary, for Q&amp;A summary, for diagnostic test summary, &amp; for results summary</li> <li>× Colors – all from Client’s brand palette: slate blue (#517C96), beige (#F0EDE3), medium grey (#A7A9AC), dark grey (#58595B), highlight with orange (#FF8200)</li> <li>× Image style and repeated image elements – photo realistic, repeating the 4 species featured</li> <li>× Font – Arial</li> <li>× Multimedia elements – for each scenario: videos, possibly some audio recordings, photos, interactive elements within Storyline including drag-and-drop activities, checklists, etc.</li> <li>× Navigational conventions – (e.g., player elements, placement, breadcrumbs, clickable objects, navigational orientation of learner, context-sensitive and other help, etc.) Resources in upper right of course player to house PDFs, left-hand menu will be used for access to other resources rather than as a menu – learner will have to navigate via the player control buttons. Navigational guidance provided.</li> </ul>