Proposal for Team Project Award LIVE Teaching Development Team Prize Development of non-technical skills in the BVetMed curriculum

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Background

Non-technical skills have been defined as 'the cognitive, social, and personal resources skills that complement technical skills, and contribute to safe and efficient task performance'.¹ These skills were originally highlighted in the aviation industry and more recently they have been adopted by in the medical field (in particular anaesthesia).

Within the framework of current training of veterinary students there are many (hidden) opportunities for undergraduates to develop these non-technical skills, such as during Directed Learning sessions and during extra-mural studies (EMS) and clinical rotations. However, course feedback and informal discussion with students suggest they struggle to appreciate the relevance of some of the non-technical skills activities, and find them difficult to relate to day-1 practice. Teamworking is an essential skill when working in the ICU and when managing emergency patients.² However, unless this is made explicit, the tendency of students to focus on knowledge and technical skills means informal learning opportunities (seeing 'teamwork in action') may be lost. Future veterinary surgeons require a more acute awareness of how these essential non-technical skills will enable them to become excellent practitioners. In order to achieve this, new learning opportunities need to be developed in order for undergraduates to see how these skills are used in every day practice.

The suggested benefits of introducing a more structured programme, designed to engage students in non-technical skills development during their clinical rotations, are as follows:

- By video recording teamworking in the ICU, highlight the successful application of these non-technical skills in the clinical setting, and by discussion of videoed cases, explain the link to minimization of medical errors and accidents and improved patient morbidity and mortality.
 Running simulation activities and recording them to provide
- additional opportunities to further develop and strengthen student communication skills and teamwork, as well as the ability to see how they perform (self-assessment)
- Using a modified version of the ANTS scoring system³, demonstrate the impact of interactions with other members of the team on clinical case management

The Project

Our primary aim for the project is to enable students to more fully appreciate the impact of their non-technical skills on clinical situations. To achieve this we aim to develop teaching materials by video recording real emergency events that require effective communication and teamwork from the ICU staff (e.g. performing cardiopulmonary resuscitation [CPR], placing a patient on mechanical ventilation, preparing a patient for emergency surgery). These are intended to highlight aspects of best practice as well as ineffective interactions and are proposed for use as learning opportunities in both pre-clinical and clinical teaching of the BVetMed course, and in veterinary nursing education.

Videoed clinical interactions will then we used as a basis from which to develop small group scenarios, whereby students work as a team in a simulated stressful clinical situation. During the Small Animal Emergency Medicine rotation students will participate and video record themselves in a simulated CPR situation. These simulations or "tactical decision games," are training tools using low-fidelity simulation developed by the US Marines for novices to assist them in decision-making during stressful times.⁴ The stress of a genuine crashing patient is difficult to replicate, however it is suggested that practicing in a moderately stressful environment (e.g. video recording) is helpful when training to effectively manage a genuinely stressful situation. We will develop/modify a template of the skills that will be assessed by using the four categories that has been developed for anaethetists non-technical skills (ANTS)³; task management, team working, situational awareness and decision making (Table 1), in order that the students can self- and peer-assess their nontechnical skills performance. An example of the ANTS system rating form is in Appendix 1. During these sessions students will work as a team to perform CPR to the standards recently published.5

Categories	Elements
Task management	Planning and preparing
	Prioritizing
	Providing and maintaining standards
	Identifying and utilizing resources
Team work	Coordinating activities with team
	members
	Exchanging information
	Using authority and assertiveness
	Assessing capabilities
	Supporting others
Situation awareness	Gathering information
	Recognizing and understanding
	Anticipating
Decision making	Identifying options
	Balancing risks and selecting options
	Re-evaluating

 Table 1 The ANTS system prototype³

Request for Budget

The main budget requests are for a high quality camcorder to record real scenarios to be used for BVetMed teaching as well as simulation teaching during rotations, a manikin for the simulation during rotations as well as consumables, and the platform and software to assist running the simulations. Comprehensive Instructor training (5 day courses in healthcare simulation provided by the Institute of Medical Stimulation) are approximately £2730 (US\$4575), and although these are not designed for the veterinary field, the concepts of simulation, scenarios, lectures, discussions and practical exercises would benefit the participants. This cost has been added onto the end, which we hope will be considered by the Head of Department should we successful with our project application. Although we believe it is not integral to the success of the project, it has been included as the gold standard in simulation training, and if not possible at this time, could be considered in the future.

Equipment/item	Make model	Cost (GBP)
Recording and editing ec	luipment	
HD camcorder (such as	Quality HD camera step	729-1299
Panasonic HC-X920E HD	down from professional,	
camcorder or Sony HDR-	better in low light	
CX900E	conditions (which will be	
	where things are filmed	
	as well as greater optical	
	zoom capacity)	
Tripod (such as	Better image	179-200
Manfrotto 755XB	stabilization and	
MDEVE)	therefore quality	
Scan Disc Memory card	X2 @ 39.00	78
Microphone	Enhance the audio	100-250
Data storage	LaCie 2TB rugged	220
	thunderbolt/USB Hard	
	Drive	
Video editing software	Adobe premier elements	60
Simulation equipment		
Critical Care Jerry K-9	Model can be used for	1700 (2782 USD)
CPR Mannequin	airway management,	
	ventilation, endotracheal	
	intubation, circulation	
	etc	
Critical Care Fluffy Feline	Model can be used for	700 (1143 USD)
mannequin	CPR, airway management	
	etc	
Disposable equipment	Ambu-bag, ET tubes,	400
for simulation	catheters	
EZ-IO	Intraosseous needle and	326
	training bones (24)	
Ipad	For running simulation,	664
	one for 'monitor' one for	
	the 'controller' @312 and	
	2 cases @10 and 1 desk	

	stand @20	
Simulation software	Sim mon or simulation	60
	monitor	
Further education		
Conference 1/2	smacc (social media and	@1500
	critical care) Chicago	
	2015	
Literature	Books on simulation and	500
	non-technical skills for	
	the development of the	
	program and the library	
Personnel		
Video editing – Brian Cox	5 days @ £250/day	1250
External expertise /		750
consultancy		
Potentially if Departmen	t funding available	
Comprehensive	X2 @ 2730, +	8460
Instructor Training	flights/hotel etc approx.	
	1500	
Total		£9957 (Including the
		instructor training
		£18417 sourced
		separately)

Timetable

If successful in application then the funds will be used to allow the team members to purchase the equipment required and to develop the teaching materials that will be used.

Teaching the BVetMed undergraduates the professionalism should be able to start in earnest in September 2015. Rotation simulation teaching will begin in February 2015. As the rotations will not have had exposure to the idea of non-technical skills, the teaching materials that will be developed will be shown to them prior to the simulation exercise and available on Learn.

Below is the anticipated timescale for the project.

	Mor	nth											
Task	1	2	3	4	5	6	7	8	9	10	11	12	12-
													24
Equipment													
purchase													
Production of													
teaching													
videos													
Planning													
structure of													
lessons													

Planning							
structure of							
simulation							
Trialing on							
student							
groups in							
rotations and							
further							
development							
Interim							
report							
Incorporation							
into rotations							
and BVetMed							
Evaluation of							
sessions and							
lectures							

I fully support this proposal for this Team Project Award and can attest to their commitment to deliver.

Woul Hirl

Professor Daniel Brockman, Head of Department of Clinical Science and Services

Evaluation of the success of the project

Feedback will be obtained from the students when those teaching materials are utlised in the BVetMed programme as well as during rotations. An open-ended questionnaire designed to evaluate students' perceptions of the importance of non-technical skills and the quality of their learning outcomes, will be implemented during the trial phase of the sessions (both lectures and rotations).

Simulations in specific situations will be explored in this project (eg, CPR, setting up a patient for mechanical ventilation, athough these could be expanded for more common/simple procedures, such as anaesthetising a stable patient). The ANTS scoring would be able to provide feedback and document improvement in non-technical skills as they progress through the course.

Future project ideas

• Simulation is relatively new in the veterinary field, and although companies such as rescue critters have developed manikins for

demonstration there is no software specifically designed for veterinary simulation. This could be further explored.

- Simulation could be incorporated into clinical training scholarship programme.
- Simulation could be used in training staff members
- CPD courses could be designed to assist non-technical skill development and simulation training for veterinary practitioners.
- Designing a website explicitly for veterinary simulation to be free to access to all.

Reference

1 Flin R, O'Connor P, Crichton M. *Safety at the Sharp End: A Guide to Nontechnical Skills*. Aldershot: Ashgate, 2008.

2. Flowerdew L et al. A multicenter observational study to evaluate a new tool to assess emergency physicians' non-technical skills. Emergency Medicine Journal 2013; 30, 437-43.

3 Flin R, Patey R, Glavin R, Maran N. Anaesthetists' non-technical skills. Br J Anaesth 2010; 105(1): 38-44

4 Crichton M, Flin R, Rattray W. Training decision makers – tactical decision games. J Contingencies Crisis Manage 2000; 8: 208-7.

5 Fletcher DJ, Boller M, Brainard BM et al RECOVER evidence and knowledge gap analysis on veterinary CPR. Part 7: Clinical guidelines. J Vet Emerg Crit Care 2012; 22 Suppl 1:S102-31.

Appendix 1

ANTS System –Observation and Rating Sheet

Consultant:	
Trainee:	
Date:	

Categories	Elements	Observations	Element Rating	Debriefing notes and category rating
	Planning & preparing			
	Prioritising			
Task Management	Providing & maintaining standards			
	Identifying and utilising resources			
	Co-ordinating activities with team			
	Exchanging information			
	Using authority & assertiveness			
Team Working	Assessing capabilities			
	Supporting others			
	Gathering information			
	Recognising & understanding			
Situation Awareness				
1 1 // ul che 55	Anticipating			
	Identifying options			
	Balancing risks & selecting options			
Decision Making	Re-evaluating			

ANTS System – Observation and Rating Sheet

Additional Notes

Rating Options	Descriptor
4 – Good	Performance was of a consistently high standard, enhancing patient safety; it could be used as a positive example for others
3 – Acceptable	Performance was of a satisfactory standard but could be improved
2 – Marginal	Performance indicated cause for concern, considerable improvement is needed
1 – Poor	Performance endangered or potentially endangered patient safety, serious remediation is required
Not observed	Skill could not be observed in this scenario