Developing and delivering quality items for high stakes assessments in the UK veterinary schools

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## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Background and context</strong></td>
<td>3</td>
</tr>
<tr>
<td>1.1 UK veterinary education</td>
<td>3</td>
</tr>
<tr>
<td>1.1.1 The veterinary curriculum</td>
<td>3</td>
</tr>
<tr>
<td>1.1.2 Assessment in the veterinary curriculum</td>
<td>3</td>
</tr>
<tr>
<td>1.2 Development of the project</td>
<td>4</td>
</tr>
<tr>
<td><strong>2. The project</strong></td>
<td>4</td>
</tr>
<tr>
<td>2.1 Aims and objectives</td>
<td>4</td>
</tr>
<tr>
<td>2.2 Scoping exercise</td>
<td>5</td>
</tr>
<tr>
<td>2.2.1 Outcomes of the scoping exercise</td>
<td>5</td>
</tr>
<tr>
<td>2.3 Workshops</td>
<td>5</td>
</tr>
<tr>
<td>2.3.1 Outcomes of the workshops</td>
<td>6</td>
</tr>
<tr>
<td>2.4 OSCE examination focus</td>
<td>6</td>
</tr>
<tr>
<td>2.4.1 Outcomes of the OSCE focus workshop</td>
<td>6</td>
</tr>
<tr>
<td>2.5 Database development</td>
<td>7</td>
</tr>
<tr>
<td>2.5.1 Memorandum of understanding (MOU)</td>
<td>7</td>
</tr>
<tr>
<td>2.5.2 Proof of concept – OSCE station sharing</td>
<td>7</td>
</tr>
<tr>
<td><strong>3. Impacts and challenges</strong></td>
<td>7</td>
</tr>
<tr>
<td>3.1 Emerging impacts of the project</td>
<td>7</td>
</tr>
<tr>
<td>3.2 Challenges</td>
<td>8</td>
</tr>
<tr>
<td><strong>4. Future plans</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>5. Acknowledgements</strong></td>
<td>8</td>
</tr>
</tbody>
</table>
I. Background and context

1.1 UK veterinary education

There are seven schools delivering undergraduate veterinary education in the UK, and all of these schools hold Royal College of Veterinary Surgeons (RCVS) approval\(^1\) for the award of membership to the college on graduation. Two schools are situated in Scotland (Edinburgh and Glasgow), and the remaining five are in England (Bristol, Cambridge, Liverpool, Royal Veterinary College London, Nottingham). This small number of schools provides real opportunity for the sharing of resources and innovative aspects of veterinary curricula. Examples of shared projects include the Wikivet\(^2\) project (an online Wikipedia-style encyclopedia) and the VetEd Symposium\(^3\) (an annual educational conference). Both these projects involve representatives from across the schools and are run for the benefit of all veterinary students, both nationally and internationally. In the last two years, an intent to formalise these relationships has also occurred, with the proposed creation of a UK Veterinary Schools Council. This organisation will continue to encourage the sharing of best practice and resources from across the institutions.

1.1.1 The veterinary curriculum

The training of veterinary students in line with the expectations described by the RCVS involves an intense period of study over five or six years. Students gain competency to diagnose and treat all species of animals, and they must be able to do this with a high level of independence. Personal and professional skills, such as communication and business skills, are increasingly included in the core curriculum components. Curricular philosophies vary across the schools, from a more traditional discipline-based approach to a modular body system format with varying levels of clinical integration. A key component of all veterinary curricula is Extra Mural Studies – multiple weeks spent on placement outside of term time activities, initially in animal production establishments and later in clinical practice. The final year of most veterinary curricula is lecture-free and based in a university-delivered clinical environment which covers a range of disciplines and species.

1.1.2 Assessment in the veterinary curriculum

Assessment strategies vary across the schools, but similar tools are utilised. Assessment of competency is challenging in any clinical context, and in veterinary medicine very little published evidence exists for validation of methods\(^4\). It is common, therefore, for schools to utilise a range of tools. At the University of Nottingham, students are assessed in knowledge, skills and attitudes via a holistic approach utilising a number of different assessment methods, including online multiple choice questions, objective structured clinical examinations (OSCE), directly observed procedural skills.

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\(^1\) http://www.rcvs.org.uk/education/approving-veterinary-degrees/
\(^2\) http://en.wikivet.net/Veterinary_Education_Online
\(^3\) http://vetedsymposium.org/
(DOPS), clinical reasoning papers, portfolios, and skills diaries. There is a similar approach in many of the other schools. This has meant that much duplication of resources has occurred, with schools owning large banks of questions which are not formally shared.

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<th>Assessment in veterinary curricula</th>
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<td>A wide range of assessment methods are utilised within veterinary curricula including:</td>
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<td>− essay and short answer written papers;</td>
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<td>− online or paper based multiple choice questions, including extended matching questions and assertion reason questions;</td>
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<td>− script concordance papers and other clinical reasoning assessments;</td>
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<td>− online drag and drop questions based on images;</td>
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<td>− spot tests, utilising specimens in a laboratory environment;</td>
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<td>− objective structured clinical examinations (OSCE);</td>
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<td>− objective structured practical examinations (OSPE);</td>
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<td>− directly observed procedural skills (DOPS);</td>
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<td>− dissertations and viva voce examinations;</td>
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<td>− other written coursework.</td>
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For further details see [http://www.live.ac.uk/Media/LIVE/PDFs/assessment_guide.pdf](http://www.live.ac.uk/Media/LIVE/PDFs/assessment_guide.pdf)

1.2 Development of the project

Following discussions amongst the schools, it was recognised that a general move to online assessment of knowledge could mean potential for a shared database of questions. As all schools must deliver teaching and assessment in line with RCVS ‘Day One Skills’⁵, content of questions was presumed to be similar and so a database is a very attractive proposition. As schools were also developing similar OSCE stations, it was recognised that these also have potential for sharing and distribution of workload.

Early on, challenges were also recognised to establishing such a database. These included:

- security concerns;
- the quality of questions;
- equivalency of contributions;
- management of data;
- funding;
- longevity.

Funding was therefore obtained from the Higher Education Academy (HEA) to enable investigation of these issues and initial development of faculty members.

2. The project

2.1 Aims and objectives

This project aimed to examine the potential for a cross-veterinary school assessment database, including an audit across the schools of current practice regarding online processes. The project was carried out in phases: a scoping exercise, training workshops, an OSCE focus stage, and preliminary development of an agreement between the schools to facilitate sharing.

Meetings (face-to-face, video or tele-conference) were held with key staff at all seven UK veterinary schools to establish needs in terms of question types used, processes for creation and review and staff training needs. In addition, members of the project team met with the heads of each school and obtained support and approval for the project. The project team have also presented an outline of activities to academic, technical and support staff at five of the seven UK schools, and have had individual meetings with local IT staff to consider infrastructure and potential installation of a shared assessment delivery system.

The Medical Schools Council operates a similar shared assessment initiative which is a partnership of all 33 undergraduate medical schools. All medical schools submit final exam questions to a question bank for sharing amongst the community. The possibility of all veterinary schools utilising an open source delivery system (Rogo) was also discussed. Rogo allows the creation and delivery of a wide range of assessment types, including calculation; dichotomous; extended matching (single answer); extended matching (multiple answer); fill-in-the-blank; image hotspot; labelling; Likert scale; flash interface; matrix; multiple choice; multiple response; ranking; text box; script concordance test (SCT) and time/date. It has built in quality control processes, and can facilitate assessment practises such as standard setting and mapping to learning outcomes.

Time and resources were provided by the University of Nottingham Learning Team to support this phase of local engagement across the schools.

### 2.2.1 Outcomes of the scoping exercise

There were several different outcomes of the scoping exercise, which allowed development of the next stage of the project. These outcomes were:

- an understanding of both generic and specific needs for high quality items, and the training of staff in their production, at each of the seven schools;
- agreement and buy-in for an on-going process of sharing resources (items and training) in order to improve the quality of questions used that will be initiated and underpinned by, but will extend beyond the life of, this project;
- a defined process for training staff in item creation;
- a collaborative agreement to develop ways of measuring item performance and the impact of training;
- an understanding of the delivery methods and current software utilised by the different schools, and a common lack of opportunity to change these methods. This was particularly true of schools where a central university unit provided assessment mechanisms. Although Rogo is open source, support is not cost neutral and most schools were unable to consider moving to a different software package for delivery of questions.

### 2.3 Workshops

Following the scoping exercise, a needs assessment established the requirement for training across the schools in writing questions for multiple choice examinations. The training was designed in a workshop format, to include the following objectives:

- an understanding of best practice creation of multiple choice questions;
- creation of new items for feedback from peers;
- development of a quality control and review process internally;
- an understanding of post examination analysis of questions;
- ability to accept or reject questions from inclusion in a paper according to quality and objectives covered.

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6. [http://www.medschools.ac.uk/MSCAA/Pages/default.aspx](http://www.medschools.ac.uk/MSCAA/Pages/default.aspx)
7. [http://www.nottingham.ac.uk/teaching/resources/tools/rogo.aspx](http://www.nottingham.ac.uk/teaching/resources/tools/rogo.aspx)
Education leads were contacted at each institution and an expert trainer attended to deliver the session. Alternatively, funding was provided to deliver the key objectives by an internal expert. A workshop was delivered at each UK school during 2013.

### 2.3.1 Outcomes of the workshops

While not formally evaluated, informal feedback indicated that delegates found these sessions extremely useful, and a marked improvement in item quality was noted. It was also evident during these sessions, while discussing the possibility of a national question database, that faculty were very keen to pursue this strategy. It became clear that faculty would also like to share practical station questions such as OSPEs and DOPS, and because of this a new project objective emerged: to investigate the potential of sharing practical exam questions.

### 2.4 OSCE examination focus

Although not a core component of the planned database, it emerged during the scoping exercise and workshops that there was a requirement for a cross-school collection of OSCE examination stations. With many schools utilising this format across a range of topics including animal handling, laboratory and clinical skills, there is clear duplication of work when two schools have covered the same station. In addition, there is much to learn regarding the delivery of the OSCE exam in the context of the veterinary curriculum and a definite desire to take this process forward.

A cross-school workshop was therefore delivered at the University of Nottingham in March 2013. This workshop covered a range of objectives relating to the design, marking and delivery of OSCE examinations and importantly included support as well as academic staff. An expert facilitator from the University of Nottingham Medical School (Dr Tim Heywood) led discussions around post-examination analysis, and the impact of this form of assessment on student learning.

### 2.4.1 Outcomes of the OSCE focus workshop

The workshop allowed discussion of a sharing process for exam stations and it was clear that sharing was already happening between some schools. However, this sharing was not achieved with sufficient security consideration and was very *ad hoc*, with no feedback on the quality of stations. The project leads, therefore, added an objective to the project aims that OSCE stations should be considered, and it was decided that these questions should form part of a pilot database which would eventually be used to share all examination questions.

A secondary output of this phase of the project was the sharing of best practice among technical staff for the delivery of OSCE examinations. It is easy to forget the impact of exams such as these on support staff, and the opportunity to discuss these challenges was clearly beneficial to all.
2.5 Database development

Following discussions amongst the schools, a secure site was chosen and evaluated by internal IT departments to facilitate the creation of an online repository for sharing questions. The site selected was Huddle. This was chosen for several reasons:

- high level closed-security;
- intelligent search function;
- clear centralised processes for collaboration;
- cheap and user-friendly.

A number of licenses were purchased and the process of setting up files and folders has begun.

2.5.1 Memorandum of understanding (MOU)

A legal process has been carried out to develop an MOU for managing and developing the repository. This has initially been created by the Universities of Nottingham, Bristol and Edinburgh, but the agreement is written to allow easy sign up of other institutions. This document is in the final stages of approval and will be signed off in January 2014.

2.5.2 Proof of concept – OSCE station sharing

Initially, OSCE and DOPS stations are being uploaded. Once these are established on the site, and all parties are happy with arrangements, further sharing will be undertaken for MCQ questions and other formats. The proof of concept phase is predicted to be completed by April 2014, once the agreement has been signed.

Initial uploading of OSCE stations has begun and the site can be found at https://my.huddle.net/workspace/23879170 (login required).

A veterinary student learning animal handling skills during a simulation session in the clinical skills lab. Practical skills are often assessed via DOPS and OSCE stations.

3. Impacts and challenges

3.1 Emerging impacts of the project

There are clear impacts of this project and these continue to increase as progress continues. Importantly, the funding has facilitated the start of this idea but it has now gathered momentum and will be funded internally by the schools, as clear benefits have been identified.

8 http://www.huddle.com/
These impacts include:

- an increasing awareness of the requirement for training in producing quality examination questions, and the importance of this in relation to the student learning experience;
- increased knowledge and skills across the schools in writing examination questions and measuring their performance and quality;
- better sharing of exemplars of good practice in examination question creation across the schools;
- a proof of concept sharing repository, which should ease the workload of academics and ensure better quality stations for OSCE examinations;
- the sharing of best practice around the delivery of OSCE examinations amongst technical staff in UK veterinary schools.

Other incidental impacts include better liaison between schools, better communication between teaching and learning leads, and further discussions around sharing of other resources.

### 3.2 Challenges

As with any project of this nature, there have been a number of challenges to overcome, and issues which required discussion between the schools. Universities have vastly different procedures for examination, design and delivery, and this has required negotiation. Unfortunately, this also meant that a joint delivery system was not possible. While disappointing, this idea will remain and will potentially be revisited in the future. Open source software is very attractive to educational institutions, but resources are still required for software management and development and this is often a cost which cannot be justified locally.

The timescale of this project has also been challenging. A staffing change at the University of Nottingham meant alteration to grant holders and implementation of the project. An extension to the grant has allowed completion of the majority of intended activities, but measurement of the impact of the workshops has sadly not been possible. However this will continue to be evaluated longitudinally, and reported through educational literature at a later date.

### 4. Future plans

The project team will continue to pursue the idea of sharing all examination questions across the UK veterinary schools. Faculty development will also remain a priority, and with training materials now developed this should prove easier to achieve.

Once the memorandum of understanding has been approved by the three primary project schools, it will be circulated among the other institutions for consideration. The hope is that more will sign up and share further OSCE stations.

The agreement puts in place a steering group to manage the database and this will be chaired on a rotating basis between the project partners, and overseen by the new UK Veterinary Council organisation.

### 5. Acknowledgements

The project team would like to thank the HEA for funding this work, and specifically Gillian Brown for her help and guidance.
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