Approaches to defining day-one competency: a framework for learning veterinary skills

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Summary
Competency at graduation, in a variety of physical and attitudinal skills, is an essential outcome measure for courses training veterinary surgeons. The approach adopted by the Royal Veterinary College, London, to identify and define the expected skill competencies required of our veterinary undergraduates by the time of graduation is described. In addition, we demonstrate how this skill set was built into a framework that was aligned with other student learning objectives. This two-year project resulted in the publication of a day-one skills handbook, which was introduced to the college staff and students in 2007.

Keywords
Competency – Competency-based education – Day-one competencies – Day-one skills – Outcomes – Outcome-based education – Quality – Standards – Veterinary curriculum.

Introduction

Veterinary graduates should be competent in the essential skills required of a newly qualified veterinary practitioner. To achieve this goal it is fundamental that there be agreement among educators and the profession about what skills should be required. It is equally important that these requirements be clearly understood by the students. 'Skills' are specific activities, and 'competence' is the ability to carry out an activity effectively, safely, and efficiently. A competency is a standard: the performance of a skill at a predetermined level of performance. The most critical competencies are those that relate to skills that a new graduate is expected to perform without any supervision from qualified staff, the so-called 'day-one competencies'. Such considerations of competency apply anywhere in the world, although the skills appropriate and relevant in one environment may differ widely from those required in another.

Attention was focused on day-one skill competencies in healthcare education in the United Kingdom (UK) in the early 1990s when the statutory governing body for the medical profession published a document that detailed clear competency standards for graduates from medical schools. This document, 'Tomorrow's Doctors' (4), stimulated the re-orientation of undergraduate medical courses towards practical day-one competencies (7). Courses changed and began to use integrated learning systems (8), and assessments that required the simple regurgitation of medical knowledge were reduced in favour of those that target practical and integrated skills (11). Although veterinary courses were not compelled to change in a similar way, there was an increase in scrutiny of the way that UK veterinary education prepared veterinary students for entry-level practice. In 1998 the Supporting Independent Learning in Veterinary Extramural Rotations (SILVER) report identified that greater structure and clearer direction was needed in the students' learning experience on Extra Mural Studies (EMS) (compulsory clinical experience outside the university). In 2001 the Royal College of Veterinary Surgeons (RCVS – the governing body of the profession in the UK) produced a document entitled 'Essential Competencies Required of the Veterinary

Surgeon' (9). This list of day-one skills addressed the basic competencies required of a new veterinary graduate, from the professional point of view. Many of these competencies are also reflected in the veterinary sciences benchmarking document that details the nature of veterinary degrees in the UK (published by the Quality Assurance Agency for Higher Education [QAA]).

There are significant advantages to incorporating accurately defined day-one competency outcomes in a veterinary curriculum. Once the minimum competencies have been defined, these outcomes can be used to inform the design and management of the undergraduate veterinary curriculum (3). Providing students, staff, and the profession with explicit statements on the competencies required, enables all stakeholders to work towards the common goal of ensuring these skills are delivered through the teaching and training process. Defined practice-oriented goals give students a tool by which they may take a more active approach to ensuring that they acquire these competencies and can play an essential part in their training to become lifelong independent learners. The RCVS Essential Competencies were deliberately broadly framed to be applicable across the UK veterinary schools, allowing them to adapt their learning outcomes to the needs and expectations of the individual veterinary school and specialism. However, such broadly framed competency standards give rise to some difficulties when they are used in curriculum implementation. The lack of specificity makes it difficult for students to recognise skill elements and relate them to other areas of their learning, and allows a wide range of opinions about the relative importance of individual skills, and the level of competence required, among staff supervising the students.

To combat these difficulties, and improve day-one competencies as a learning tool, the Royal Veterinary College (RVC) decided to develop its own day-one skills framework. We had the additional incentive that we were concurrently developing a veterinary Clinical Skills Centre (CSC) as a novel learning environment, and introducing the use of Objective Structured Clinical Examinations (OSCEs) to evaluate our students' practical skills. Both of these developments required clear outcomes in order to provide the best additions to the learning experience of our students, and we hoped the day-one skills framework would fulfil that role. Additionally we hoped that the framework would provide outcomes as a focus for integration in a strategic curriculum review.

Methods

The principal author was the nucleus of the study and was funded by a National Teaching Fellowship Scheme award made to co-author Prof. May. Additional support was provided by senior academic staff of the RVC and educational staff from the RVC's Centre for Excellence in Teaching and Learning (CETL). The objective of the project was to produce a defined and agreed list of day-one skills in a format that students and staff would find easy to use as a learning tool.

The project stages were:

– development of a provisional RVC day-one skills list by collating the existing UK benchmark documents on day-one competencies and subdividing broadly framed skills into more specific, unambiguous, competency targets

– review of this provisional list by subject experts

– the survey of a cross-section of veterinary opinion on the importance of each skill at the day-one level

– collation and review of the results of the survey to produce a final list of day-one skills

– production of a day-one skills handbook available electronically and in hard copy.

Stage 1

The RCVS Essential Competencies Statements and UK veterinary undergraduate 'subject benchmark statements' (published by QAA) were used as the basis for the development of an RVC day-one skills list. Each RCVS competency statement was mapped to its equivalent QAA benchmark statement. Every RCVS and QAA competency outcome was then broken down into some associated individual skill elements. For example, from the RCVS essential competence 'perform a complete clinical examination' and the QAA equivalent 'perform a thorough clinical examination including non-specialist examination of all major body systems' came 48 specific skill elements, including 'recognise common breeds of animals', 'score body condition' and 'recognise presence of key notifiable disease and take necessary action immediately'. This provisional list of potentially relevant skills was then arranged into subject groupings based on the original subject groupings in the RCVS and QAA documents. Some additional groupings such as a section on health and safety and a section on husbandry skills were added where no equivalent RCVS or QAA equivalent existed.

Stage 2

The provisional list was reviewed with appropriate academic and clinical experts in subject-specific groups. One-to-one interviews were set up between the primary author and subject experts, lecturers, module leaders and clinicians within the College. The approximate interview time was 30 to 45 minutes. Each interviewee was asked to

consider what a new graduate should be competent to do unsupervised, within their area of specialism. To provide focus for the discussion, interviewees were shown the list containing the RCVS and QAA outcomes, and any items already provided on the associated RVC provisional list. Specifically, interviewees were asked to identify those skills on the list which they agreed were essential day-one skills, any significant gaps, inappropriate inclusions and alternative suggestions of wording. They were also asked to provide clarification of any differences for particular species variations. For example, the skill 'perform ovariohysterectomy in a cat' might be considered an appropriate day-one skill whereas 'perform ovariohysterectomy in a bitch' might not be. These interviews resulted in an amended provisional skill list based on the cumulative opinions of the staff consulted.

Stage 3

A wider input into the provisional skill list was solicited by obtaining a cross-section of veterinary opinion through a questionnaire survey. In the survey the skills were listed against five species categories: equine, farm animal, cat and dog, small mammals, and exotics. The survey was distributed to 100 veterinary surgeons on the RVC staff. A covering letter providing background information about the reasons for the survey and instructions on how to complete the form was included. It was explained that the results of the survey would be used to provide a day-one competency framework. The survey asked respondents to identify the skills which they considered to be an essential day-one skill and in which species of animal. The survey included a range of skills, some of which we believed everyone would consider to be day-one skills, others which we thought were more debatable and a further group which we anticipated respondents would not consider to be day-one skills. We included these 64 additional 'distractor' skills to encourage our respondents to identify a dividing line between day-one skills and more advanced skills. This group was drawn from competencies identified in the RCVS documentation as competencies to be acquired in the first year after graduation. We also asked respondents to identify and add any skill/s which they felt were essential day-one competencies but which had not been included on this list. Participants were encouraged to annotate the form to identify any skills which they felt were ambiguous or unnecessary. The questionnaire asked the respondents for additional identifying information such as name, university of clinical qualification, year of qualification, additional qualifications, the percentage of species treated in the first 12 months after graduation and percentage of species treated in the last 12 months. This was included in case a group of respondents linked by one of these elements identified as essential a skill which all the other groups considered unimportant.

Stage 4

The results of the survey were analysed and collated, firstly to identify all those skills for which there was unanimous agreement that the skill should be a day-one skill, and secondly, to identify the skills for which there was not unanimous agreement. Of the skills for which there was not unanimous agreement, those that had been considered not appropriate by five or more respondents were put forward for further discussion, as it was decided, arbitrarily, that five negative responses indicated a significant level of unease about the inclusion of an individual skill at the day-one level. An expert panel of six veterinary surgeons, four RVC senior staff and two external practitioners – whose combined areas of expertise included large animal, small animal, equine, first opinion mixed, and welfare work – further discussed the skills over which the survey had not produced agreement. In most cases a consensus was reached within this group as to the suitability of these skills for inclusion in the final skills list, but in some cases opportunity was allowed for a wider discussion before a final decision was made.

Stage 5

The final list was given to a group of educationalists in the RVC's Lifelong Independent Veterinary Education unit, who devised a coherent, accessible framework and placed the skills within it, using the process described by Mansfield and Mitchell (6). This framework related competencies directly to the undergraduate curriculum.

Results

Stages 1 and 2

The original review and consultation on the pre-existing descriptions of day-one skills produced an amended skill list with 443 skills under 15 topic headings in an 11-page document. This document was the basis of the wider survey.

Stage 3

Of the 102 surveys that were distributed, 30 were completed and returned (a response rate of 29.4%). Seven of these surveys were completed by individuals who had been consulted in the initial consultation. All of the surveys were reviewed for their suitability for inclusion in the processing and any incomplete surveys were discarded. Twenty-eight surveys were analysed. Thirteen out of 28 surveys were returned electronically via email, the rest were completed by hand and returned as a hard copy. The number of 'yes' and 'no' responses for every skill were

tallied and the data entered onto a spreadsheet. Two hundred and twenty-four of the 443 skills had a unanimous 'yes' response. Of the remaining 219 skills, 99 had five or more negative responses as to their suitability, and this group was highlighted for further discussion.

Stage 4

During the review process with the expert panel, 61 of the 99 skills with five or more negative responses were identified as being inappropriate for inclusion in the day-one skills list. Forty-one of these were skills that had been deliberately added as distractor skills in the original survey. The other 20 skills that were rejected were either examples of more complex skills in a subject area, or skills particularly related to one species. Of the remaining 38 skills that were considered appropriate, 23 had been drawn from year-one competencies. Most of these related to the ability to diagnose and treat conditions within specific body or organ systems. The other skills that were included in the list were either professional competencies or those that related to tasks that are commonly carried out by para-veterinary staff in the UK. The panel felt these were truly important and included them despite their rejection by a significant minority of respondents. The panel also highlighted the specification of some skills to particular species in their review. There were some skills which the panel felt were not generic across all species but which should be included nevertheless, e.g. restrain for blood sample collection: jugular, cephalic, tail vein (cows), ear vein (pigs).

Stage 5

The educational team was able to take the final skill list and fit it into a day-one skills competency framework. A number of the skills, particularly those relating to professional practice, were re-worded to make them more accessible to learners before inclusion in the framework. The framework had four key purpose areas: Professional Practice, Evaluation of Animals and their Care, Clinical Decision Making, and Care and Treatment of Animals. Each of these sections was divided into three levels: area of practice, specific requirements, and range. The resultant document was presented in the form of a pocket-sized handbook on wipe-clean, tough paper, so that students could carry it around with them, and have it accessible during clinical rotations, and EMS. The document is also available electronically at www.live.ac.uk/documents/DOS_handbook.pdf in a similar format to the booklet. In September 2007 the day-one skills handbook was released to third-year BVetMed students at the start of the clinical years of the veterinary programme. Fourth- and fifth-year students received the document a month later during their clinical rotations, and in February 2008 the handbook was introduced to first-year BVetMed students prior to their

first clinical placement in animal husbandry (usually lambing in the Easter holidays of the first year). The use of the handbook is now a standard feature throughout the RVC's BVetMed course.

Discussion

In a similar fashion to much larger initiatives in the medical profession (2, 10), this project successfully produced a defined list of day-one competencies for RVC students within a framework that reflects their learning. The list produced is clearly related to the requirements of a UK graduate, but the process would produce a similar list suitable to courses in other parts of the world.

The initial consideration depended heavily on the pre-existence of documents in the UK outlining in broad terms the day-one competency requirements. The collation and rationalisation of these documents into an amended skill list for the survey was not a difficult task, but was lengthy due to the number of consultations required, and definitely needed the focus of a single individual (the primary author) to mastermind the process. Although time consuming, these interviews were deemed to be the most effective approach to obtaining senior clinical staff engagement in the project and therefore promoting their ownership of the product of the project, the day-one skills handbook. Focus groups were a possible alternative but it was thought that there was too high a risk that they would be more time consuming for the clinicians and less likely to result in agreement and ownership. The interviews resulted in an 11-page document listing 443 skills. The list was used to develop a survey that was sent to veterinary practitioners, but the response was poor (29.4%), and the length of the list was undoubtedly partially responsible for this, particularly given the high workload of veterinary practitioners. Another component of the poor response rate was individuals who felt their practice was so specialised they were unable to comment on all species. However, in a large number of replies, the opinions of the complete spread of practitioners on every area would have been valuable and we could have made this clearer in the survey instructions. Despite the low response rate the validity of the survey was supported by the identification of many of the 'distractor' skills as unsuitable. It is also possible that the validity of the survey could be considered suspect as it was sent out to university staff; but it should be taken into account that the whole list was based on the RCVS document that had been the result of a large consultation with non-university veterinary surgeons. Clearly it would be possible to alleviate the problems caused by such a long survey document by decreasing the number of skills that individuals were asked about. In an equivalent document for medical graduates in the UK, the day-one skills are summarised in a single page of text

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because they are much simpler due to the stratification and specialisation of the medical profession. Such simplification does not work for the veterinary profession in the UK, as graduates here require a large range and number of day-one skills. In addition, due to the high degree of competence that is required by most courses across a full range of domestic species, all aspects of professional life need to be represented in a competencies framework, so a consultation needs to balance the views of practitioners from different specialities on all the competencies.

The system of consultation used to develop the initial list of skills and review the survey replies is modelled on the idea of soliciting expert views, summarising them and then allowing a re-consideration before coming to a conclusion. This is considered to be a suitable method for gaining a consensus of expert opinion (2). This was particularly useful in resolving conflicts regarding the weighting of underpinning knowledge versus practical ability, and the level of responsibility expected of a new graduate. With the continuing expansion of information available on all subjects it is not practical or possible to provide all the background knowledge and practical skills in an undergraduate course, so the solution is to define a balance of providing essential underpinning knowledge with the skills to enable students to resource information when they need it. For example, in this process a group of skills relating to diagnosis and treatment of specific organ systems, originally included as distractors, were included in the final day-one framework. This relates to the ambition of the university to teach generic skills in evaluation and clinical decision making, and expect its graduates to be able to apply them. These distractor skills were included, but re-worded to place emphasis on the generic ability to solve problems, rather than the knowledge required for diagnosis and treatment based on pattern recognition. Our ambition was not limited to dealing with clinical problems, but extended to consolidating the importance of evaluation and decision-making skills across the whole spectrum of attitudes and behaviour required of a professional.

We considered the form of the output of the study, the day-one skills booklet, to be very important. The design, style of presentation, accessibility of language and framework, and avoidance of jargon is very important if it is to be accessed as a learning tool by students at all stages of the curriculum. In addition, the framework must be able to accommodate future changes to the course, and to the profession, and reflect changes in clinical practice. Clearly we have further work to do in discovering how successful this initiative is as a learning tool, by surveying the students' reaction to it in the future. However, it is centrally linked to our strategy of assuring a definitive level of day-one competency at graduation, and the skills in the document define a list on which the students can expect

assessments to be based. The document also needs to be reviewed in response to on-going changes in veterinary practice, and we propose to use the course co-ordinators from the BVetMed course as a focus for this review.

From an educational perspective the day-one competencies are important because they constitute a set of learning outcomes. Outcome-based education has numerous benefits, especially in that it gives teachers and students a clear idea of the priorities in learning (1, 5). Outcome measures that involve the skills that they will need to practise at graduation are particularly valuable to veterinary students who often struggle to relate the weight of scientific learning early in their courses to the end product of veterinary practice. Clearly stated day-one competencies have two-way benefits in this environment: students can see how their underpinning knowledge relates to their future practice, which ultimately strengthens that practice; and their attention is focused on better understanding basic principles because they can understand their long-term importance. However, the competencies need to be quite specific so that students can clearly chart blocks of achievement as they go through the course.

Broad learning outcomes for day-one skills are the easiest targets for the professional body to delineate, because they relate to the ability to handle the individual cases or health problems that veterinary surgeons have to deal with. However, these broad outcomes are frequently composed of numerous component skills. It is important that students have the component skills defined for them, so that they can maximise the opportunities to practise them and relate their accumulation of component skills to competency in the broader areas of solving animal health problems, whether on an individual or herd basis. This project produced a framework for day-one skills that relates most specifically to practice in the UK or Northern Europe and it is clear that there would be some very different components to such a framework in other parts of the world. However, given students' attraction to and engagement with practical skill frameworks it seems reasonable to think that the veterinarians' role in health care could be improved by adopting competency targets in as many veterinary courses as possible. Perhaps the most important part of any competency framework in this respect is the transferable attributes of reflective practice and lifelong learning, which promote the ability of the individual to recognise the priorities for animal health and their own need for competency in the areas specific to their practice.

In the series of papers in this volume there is clear direction as to how to improve public health education in all veterinary schools. How is this to be achieved? This current paper would suggest that the skills and knowledge for global public health should be incorporated into the

day-one skills handbook as a guideline to the overall competencies that all veterinary students should possess at the time of their graduation. This then needs to be adopted by the school's faculty AND the programme should contain both the training opportunities essential to achieve these competencies AND an assessment that demonstrates whether or not these skills have been attained. It is this type of directive that will probably be the most effective means of ensuring that such education occurs. To reemphasise, there are clearly significant advantages to incorporating accurately defined day-one competency outcomes in a veterinary curriculum. Once the minimum competencies have been defined, these outcomes then become the base to inform, design and manage the undergraduate veterinary curriculum. Explicit statements on the competencies required enable all stakeholders, and particularly students, to work towards the common goal of ensuring these skills are achieved through the teaching and training process.

Acknowledgements

Comment déterminer ce que doivent être les compétences au premier jour : un cadre pour acquérir les compétences vétérinaires

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Résumé
La capacité des étudiants à maîtriser un certain nombre de savoir-faire physiques et de savoir-être au moment du diplôme est un aspect important de la formation initiale des vétérinaires praticiens. Les auteurs décrivent une initiative du Royal Veterinary College de Londres visant à déterminer et à définir les compétences dont doivent pouvoir faire preuve les étudiants en médecine vétérinaire au moment du diplôme. Cet ensemble de compétences a été incorporé dans un cadre plus vaste qui tient compte d'un grand nombre d'objectifs d'apprentissage. À l'issue de ce projet, qui a duré deux ans, un manuel des compétences au premier jour a été publié et distribué aux enseignants et étudiants en 2007.

Mots-clés
Apprentissage basé sur les compétences – Apprentissage basé sur les résultats – Compétence – Compétences au premier jour – Norme – Programme d'enseignement vétérinaire – Qualité – Résultat – Savoir-faire au premier jour.

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Métodos para definir las competencias que debe reunir el recién titulado: marco de referencia para la adquisición de habilidades veterinarias

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Resumen

Las competencias del recién titulado, concretadas en una serie de habilidades físicas y de conducta, son una medida esencial de los resultados de toda formación que dispense títulos de veterinaria. Los autores describen el método utilizado por el Royal Veterinary College de Londres para determinar y definir las habilidades y competencias que se esperan de los alumnos de veterinaria al término de sus estudios de licenciatura. Además, explican el modo en que esas habilidades se inscriben en un marco de referencia congruente con otros objetivos de aprendizaje del alumnado. Este proyecto de dos años de duración se tradujo en la publicación de un manual sobre las competencias del recién titulado, que se presentó al personal y los estudiantes de la facultad en 2007.

Palabras clave

Calidad – Competencias – Competencias del recién titulado – Enseñanza basada en las competencias – Enseñanza basada en los resultados – Habilidades del recién titulado – Normas – Plan de estudios veterinarios – Resultados.

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