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Entrustable Professional Activities (EPAs): a framework for authentic assessment in the curriculum and beyond

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Title:

Entrustable Professional Activities (EPAs): a framework for authentic assessment in the curriculum and beyond

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Intended Learning Outcomes:

After reading this article, you should be able to:

- Recognise the basic features of competency-based veterinary education;
- Define what entrustable professional activities (EPAs) are and how they can be used in a veterinary context;
- Reflect on how the EPA framework allows for timely and authentic feedback to be given;
- Recognise how EPAs aid the transition into clinical practice with their incorporation into the RCVS' Veterinary Graduate Development Programme;

- Reflect on the benefits of developing a culture of education in practice;

Abstract:

This article discusses Entrustable Professional Activities (EPAs), a framework for guiding teaching, assessment and feedback in the workplace, now widely used in medical education.

It outlines the benefits of the approach and the challenges that can be encountered when implementing it in the veterinary educational context. It includes the experiences of two newly graduated veterinary surgeons, who trialled two EPAs during their final year and are now using EPAs in the Veterinary Graduate Development Programme (VetGDP).

Introduction:

The Royal College of Veterinary Surgeons (RCVS) Day One Competency document defines competence as the combination of skills, knowledge and attributes that leads to “the ability to perform the roles and tasks required by ones’ job to the expected standard” (RCVS, 2022). Learners progress their clinical skills, knowledge and develop their non-clinical skills and professional identity across a continuum of developmental milestones. These have been defined by the Association of American Veterinary Colleges (AAVMC) over six levels which expand beyond graduation into early professional development (Table-1, (Chaney KP et al., 2024)). These frameworks for competency-based veterinary education (CBVE), are centred

on the learner's development and readiness to transition to practice, rather than in a pre-determined length of training. They define domains of competence (i.e., communication) and competencies within them (i.e., ability to adapt the communication style to diverse audiences).

CBVE relies on the observation of learners performing professional activities in teaching environments. Mapping to Miller's pyramid (Miller, 1990), assessments such as Observed Structured Clinical Examinations (OSCEs) test the technical skill of a learner (the "shows" in Miller's pyramid, figure-1) in a controlled teaching or 'laboratory' environment (Boursicot et al., 2021; Harden & Gleeson, 1979). However, to assess higher levels of integrated competencies (the "does" in Miller's pyramid), educators have developed many workplace-based assessment (WBA) tools designed to be used in authentic clinical environments (Anderson et al., 2021; Duijn, Dijk, et al., 2019; Kogan et al., 2009; Prakash et al., 2020).

Although these WBA tools have greater authenticity, a common criticism is their limited evidence of reliability and validity, and the need to train clinician-teachers on their use.

When such WBA tools are used in a formative way (i.e. feedback is provided after the observed performance with no direct consequences for progression) they have been shown to have a strong positive influence on learning (Norcini & Burch, 2007).

Where do Entrustable Professional Activities (EPAs) come from?

Entrustable Professional Activities (EPAs) were first described in 2005 as a WBA tool to help supervisors in their determination of competence of trainees (ten Cate, 2005). They were originally described in the post graduate context but more recently have been developed for use in the undergraduate curriculum. In a recent review, they have been defined as “a unit of professional practice that can be fully entrusted to a trainee” (Ten Cate & Taylor, 2021). They are designed to be used by clinician-teachers as they observe a learner performing a specific task in an authentic clinical environment. Clinician-teachers can assess performances in a holistic way, therefore capturing not only how learners demonstrate a skill, but also how they integrate different competencies (i.e., communication and professionalism) or adapt to uncertain, unpredictable clinical situations. Therefore, they align with the concept of capability which reflects the ability to integrate and adapt knowledge, clinical and non-clinical skills to different and unfamiliar situations. (Fraser & Greenhalgh, 2001; Hanks et al., 2021).

This holistic assessment is captured by the use of entrustability scales, by asking clinician-teachers if, based on their observations, the learner “can be entrusted” to perform the task with a given level of autonomy/assistance. The assessment can be retrospective based on the observed activity, or prospective for the next time the learner is performing the task (table-1). The EPA framework also facilitates the provision of timely and authentic feedback encouraging learners to improve their clinical performance to reach autonomy, therefore

reinforcing the concept of WBAs as educational tools with a strong influence in learning (Norcini & Burch, 2007) and in particular aligning students' goals with ultimate autonomy in the workplace.

What about EPAs in veterinary medicine?

In medical education, EPAs are widely used in postgraduate education as part of competency-based medical education frameworks and are expanding into undergraduate years. Although the context is similar, it is important to note that the road to autonomy is more challenging in veterinary education, with a steeper trajectory as newly graduates are fully licensed to practice across a range of species, compared to the partial license obtained upon graduation in medical education (Quentin-Baxter et al., 2005). In addition, the RCVS code of professional conduct (based on the Veterinary Surgeons Act) stipulates the degree of supervision required when allowing undergraduate veterinary students to perform clinical activities (Table-2), which influences the use of an entrustability scale as it relates to the nature of the task and the level of autonomy that is permissible under the act. In veterinary medicine, in 2015 a working group from the AAVMC developed eight core EPAs for undergraduate students using the nine domains of competence and thirty-two competencies defined in their CBVE framework (Chaney KP et al., 2024). Further core and nested EPAs (e.g., smaller units of clinical activity that are part of a larger, overarching EPA) have been proposed for surgery (Favier et al., 2020) and farm practice (Duijn, Ten Cate, et

al., 2019) (e.g., “perform a history and (physical) examination to arrive at a differential diagnosis” with sub-EPAs “individual animals” and “herd animals”). For postgraduates, EPAs have been used to design a programme in Emergency and Critical Care (Noyes et al., 2021) and in accreditation of specialties such as Dermatology. In addition, the RCVS has incorporated EPAs in the Veterinary Graduate Development program (VetGDP, launched in September 2021) to support the transition into practice by building a framework of bespoke clinical coaching linked to a series of core EPAs (Prescott-Clements et al., 2022). For undergraduates, many veterinary schools are starting to incorporate EPAs in their curriculums (Read et al., 2021). At the Royal (Dick) School of Veterinary Studies, two core EPAs were trialled on a voluntary basis during the selective intramural rotations with final year students in the Small Animal Teaching Hospital (cohorts 2022-2023 and 2023-2024), using a retrospective four-point entrustability scale and milestone-based rubrics (Figure-2). A bespoke training program for clinical staff was created, alongside service-based training on the use of EPAs in the clinical workplace. Educational material for members of clinical staff and students was generated and distributed in the workplace. The milestones-based rubrics were co-created with clinician-teachers, representing all the clinical services of the hospital. Focus groups and semi-structured interviews with participating clinician-teachers and students were conducted. Data analysis is ongoing to explore the acceptance, feasibility and educational impact of the two EPAs piloted, with results due later in 2025.

Implementing EPAs in undergraduate curriculums and in clinical practice (VetGDP programme)

Implementation of an EPA framework in the curriculum takes time and resources (Peters et al., 2017). In medical education, residency-entry core EPAs were trialled by ten medical schools in a co-ordinated effort over a five-year pilot followed by a two-year extension (Brown et al., 2022; Lomis et al., 2017). Post-pilot improvement studies recognised challenges such as differences in how schools approach the entrustment process (Moeller et al., 2020), whether EPAs should be used in a formative or summative nature, where the responsibility lies (learner/teacher) to drive their use (Geraghty et al., 2021) and how to engage clinician-teachers with EPAs (Encandela et al., 2023). In Sweden, a nation-wide strategy took place to appraise if the proposed core EPAs were adequate for the country. With representation from each medical school and students, ten core EPAs were developed which were further tested for social validity with a national online survey (Gummesson et al., 2023).

Engaging clinician-teachers is particularly important for the implementation of EPAs in practice, such as through the VetGDP programme. It is important to highlight that, although there is a culture of mentoring in clinical practice, current clinician-teachers may only have experienced EPAs as a VetDGP mentor or mentee, and may not yet be aware of the potential of EPAs to provide a continuum of support from veterinary school to early

professional development or in return-to-work programs (i.e., post-maternity or illness).

Additionally, clinical teams by necessity prioritise patient care and team performance, and can perceive mentoring programs as a time-consuming “intrusion” which can then be degraded to a “tick box” exercise (Encandela et al., 2023). The medical literature suggests that, even if support is available, clinical teams rely mainly on trial and error for implementation of change rather than change management strategies (Bank et al., 2019).

Therefore, it is important that institutions recognise the challenge and develop a strategy for training every member of staff involved in clinical teaching in the workplace and a strategy for change management, working alongside learners to develop a culture of education within the workplace (Steinert et al., 2016). Additionally, further research into both the practicalities of implementation, and appropriate stage(s) of the curriculum to embed assessment aligned to milestones and entrustability is warranted. There is an excellent opportunity for the regulator and the wider profession to engage in this research as the EPA-based approach becomes further embedded in the postgraduate context.

Summary

An expansion on the use of EPA frameworks is taking place in veterinary education - both in the curriculum and also in the workplace to support new veterinary graduates in transitioning to the workplace. There is an opportunity to further foster communication between the RCVS, veterinary schools and RCVS-approved graduate development practices

and workplaces to align strategies and work towards a shared mental model of CBVE as the EPA approach becomes further embedded in the veterinary education context.

CASE STUDY 1: BONNIE YANG, 2024 R(D)SVS GRADUATE

Bonnie Yang works at a first-opinion small animal hospital in the West Midlands, England.

Here, she shares her experience participating in the Entrustable Professional Activities (EPA) trials at the Royal (Dick) School of Veterinary Studies before graduating and how it helped ease her transition into practice as a new graduate.

Being a newly graduated veterinary surgeon is an exciting milestone, but the transition from student to qualified vet can feel overwhelming. My experience participating in trials of Entrustable Professional Activities (EPAs) during the final months of intramural rotations has significantly boosted my confidence before graduation, and the benefits have carried over as I begin my role as a general practitioner.

At the Royal (Dick) School of Veterinary Studies, we had the opportunity to take part in trials for two core EPAs, EPA1 and EPA7, which cover essential tasks that most new graduates perform on their first day in practice. To begin, we had to request permission from an EPA-trained clinician to register an upcoming case for the trial. The clinician would be present while we carried out tasks like consultations or anaesthesia planning and administration. Afterward, we discussed the case using an online form that assessed the steps and aspects of the EPA, allowing both the student and the clinician to assign a competency level based on a four-point entrustability scale and milestone-based rubrics.

This process offered a valuable opportunity to evaluate our own competency and identify strengths and weaknesses. What sets it apart from traditional verbal feedback is that, by clearly identifying it as an EPA trial, the student is closely observed, with attention to detailed steps outlined in the milestone-based rubrics. This structured framework allows for in-depth discussions between teacher and student, breaking down each task into its components. It provides clarity on which specific aspects of a complex task are well-executed and which need improvement. The feedback is concrete, providing actionable steps for growth. Being a near graduate at that point, it was reassuring to be recognized for competency in certain areas.

Shortly after starting my new job, I realized that participating in EPAs had helped me feel more confident working independently. By practicing breaking down complex tasks into manageable steps, I could focus on each stage individually, reducing anxiety. The EPA trials not only provided a record of our strengths and weaknesses but also opened up opportunities for further discussion on how to improve, along with tips and strategies for handling challenging cases. In addition, writing a self-reflection as part of the trial reinforced the learning experience and strengthened my retention of key concepts.

EPA trials have been instrumental in building my confidence and skills as I transition into veterinary practice. The structured approach and detailed feedback helped me better handle complex tasks. All in all, the EPAs provided a strong foundation for my continued professional development and have empowered me to grow as a confident, independent practitioner.

CASE STUDY 2: BHADRA NAIR, 2024 R(D)SVS GRADUATE

Bhadra Nair works at a first-opinion small animal centre in the East Midlands, England. Here, she shares her experience with transitioning to practice and how using Entrustable Professional Activities (EPA) at the Royal (Dick) School of Veterinary Studies before graduating impacted this transition.

As a final year student at the University of Edinburgh, my experience with EPAs was extremely positive. I saw them as a realistic way to assess my competence that would directly translate to what would be expected of me as a graduated and practicing veterinarian. This belief has only strengthened with my experience of VetGDP. Although not having as strict a framework as the EPAs in university, the activities used in VetGDP have a similar type of criteria and work as a measure of a new graduate's ability to perform in the workplace. This has greatly helped me as I transition from being a student to being a veterinarian.

The EPAs that were assessed in university (for the pilot) were also very similar to the ones used in VetGDP i.e. history taking or maintenance of anaesthetic. This has helped me compare my progression through the stages (advanced beginner, competent, proficient etc.) more realistically between being a student and a working professional. It is also to be noted that the framework of the EPAs considers various essential soft skills such as client interaction, methods of history taking as well as communication with colleagues as part of the task. I have come to realise that the assessment and development of such skills in a structured fashion has given me the chance to become a better member of the team at my new practice and better communicate with the varied clientele that I am exposed to now.

Before the EPA system, the vet school used an expectation-based system where students were assessed for their performance of a clinical skill after which the assessor would declare that they met, did not meet, or exceeded expectations of the assessor. This, in my opinion, was very subjective and not comparable between services and individuals – it was difficult to standardise what was to be ‘expected’ of each student. The EPAs on the other hand, using the entrustability component, was better suited to consistency regardless of operator or service. The idea of whether a student would be able to function as a colleague is a much better measure of ability. While this does not mean that services need not be trained, when trained operators use this system, it is much easier to achieve uniformity.

One aspect of the EPA assessment in university that I particularly enjoyed was that both the student and the assessor had to assess and grade the performance of the skill using the same framework. Often, this helped identify gaps in a student’s knowledge or conversely, helped boost a student’s confidence in their own ability. A similar aspect in VetGDP is the 1-2-1 discussion – this sort of interaction with the assessor helps support a new graduate while also providing them with actionable advice tailored to their individual needs.

All in all, I believe that EPAs are a valuable teaching tool that can be used to help transition students and new graduates into being well rounded professionals.

Table-1: Developmental milestones defined by the AAVMC, and the retrospective, four-point entrustability scale used at the R(D)SVS.

Developmental milestones				
Pre-novice 1 and 2	Novice	Advanced Beginner	Competent	Proficient
Level expected from entry point and early phases of the programme to preparation to enter the clinical environment	Minimum expected level for entry into clinical workplace	Developing competence	Expectation for day-1 practice	Aspirational expectation after some time in practice
Entrustability scale	I had to do all/most of the task	I had to provide help at several points	The student didn't require much assistance from me	The student didn't require any assistance from me

Table-2: Summary of the level of supervision required for veterinary undergraduate students as they perform clinical activities during their training, based on current RCVS guidelines.

Clinical Activity	Type of supervision	Definition
Physical Examination Diagnostic Test	Direction	Students are instructed by the supervisor but presence is not required
Administration of Treatment	Supervision	The supervisor is present in the premises and available to provide assistance
Performance of a surgical operation	Direct and continuous personal supervision	Full personal attention is provided to the student

Figure 1: Miller's Pyramid which encompasses the elements required for clinical competence – from the underpinning cognitive levels of knowledge and application of knowledge (Knows and Knows How) to the behavioural levels of practical competence (Shows) and how a doctor (or veterinary surgeon) actually performs in practice (Does) (Miller, 1990). Examples of relevant assessment options for each level are shown

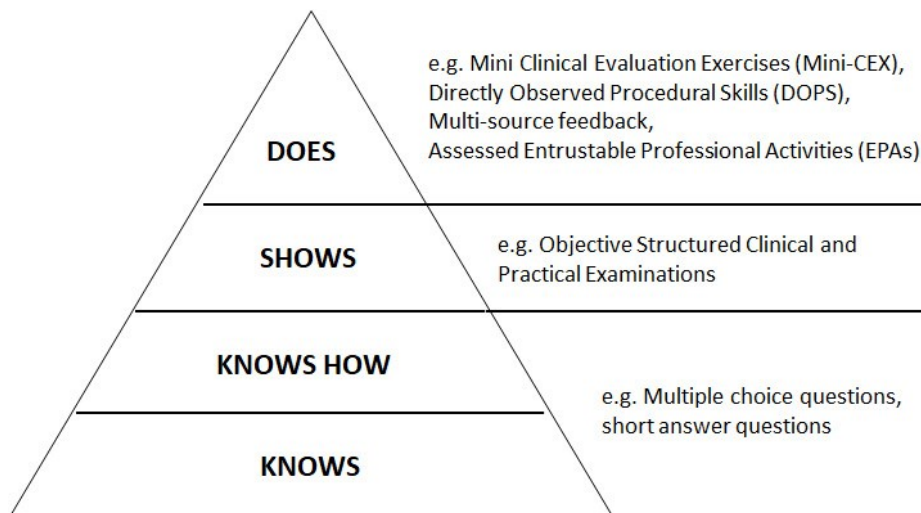


Fig 2: Two core entrustable professional activities (EPAs) were trialled in a pilot study at the University of Edinburgh. Following the completion of an observed task, the form was filled in by the clinical educator or the student (as instructed by the clinical educator) using a portable device (e.g., mobile phones). (a) A link/QR code was used to access the EPA-based assessment tool and fill in the general questions, including the consent for participation. (b) The entrustability scale for each component of the EPA was filled in. (c) Using the rubric provided as reference, the milestone description closest to the performance observed was selected (pre-novice, novice, advanced beginner, competent, proficient) for each component of the EPA. (d) The student would self-assess and select the overall milestone reached in the performed task and the level within the milestone (early/mid/high), then the educator would rate the performance in the same way. (e) The student filled in the self-reflection section (e.g., feedback provided and possible steps to improve in the future). The last two questions included a declaration that the assessment had been filled in between the student and the clinical educator and the time involved in the assessment.

1. Participant consent form: this pilot study is part of a doctoral research study into the design and use of EPAs as a workplace-based assessment tool for final year students during their clinical rotations in the Hospital for Small Animals, R(D)SVS. You agree that: 1) You have read and understood the information provided in the EPA booklet; 2) Questions about your participation in this study have been answered satisfactorily; 3) You understand that you are free to withdraw (up to the point of data analysis) without giving any reason, without your teaching or assessment being affected; 4) You understand that the data collected will be anonymised and will appear in publications and reports relevant to this area of research; 5) You are willing to take part in this research.

2. Assessor Name * [🔍]
Select your answer

3. Student Name * [🔍]
Enter your answer

4. Student Matriculation Number (eg s190001) * [🔍]
Enter your answer

5. Rotation Week * [🔍]
 Cardiology

6. What species did you work with? * [🔍]
 Dog
 Cat
 Rabbit
 Exotics (including other small mammals)

7. Was this a referral level procedure (see guidance)? * [🔍]
 Yes
 No

8. Date of feedback observation * [🔍]

Use the link /QR code to access the EPA-based assessment tool and fill in the general questions, including the consent form for participation in this pilot study:

9. Assessor feedback on the student's entrustability for each of the following parts of the EPA-1 task * [🔍]

I had to do most/all of the task

I had to provide help at several points

History taking

Physical Examination

Problem List and Differential Diagnosis

Fill in the entrustability scale for each component of the EPA. The clinical educator can fill this in, or it can be filled in by the student as instructed by the clinical educator.

10. Which of the following milestone descriptions is closest to the performance in this EPA-1 task for history taking? * [🔍]

Pre-novice may struggle to build rapport/trust with owners, which may translate as a lack of professionalism (suboptimal patient-client relationships). Mostly uses inappropriate terminology, does not follow a systematic approach, easily losing concentration. Mostly uses leading questions. May miss important and/or relevant information. Suboptimal integration of previous medical history and/or ongoing medication with presenting concern (often apparent lack of knowledge). Finds it difficult to adapt to a given timeframe.

Novice communicates in a primarily professional manner with limited

Using the rubric provided as reference, choose the milestone description closest to the performance shown during completion of the task (pre-novice, novice, advanced beginner, competent, proficient) for each component of the EPA.

15. Which milestone do you (student) think you reached based on your overall performance in EPA-1? * [🔍]

Pre-novice
 Novice
 Advanced Beginner
 Competent
 Proficient

16. Which level within the milestone do you (student) think you reached based on your overall performance in EPA-1? * [🔍]

Early

17. Which milestone do you (educator) think the student reached based on the overall performance in EPA-1? * [🔍]

Pre-novice
 Novice
 Advanced Beginner
 Competent
 Proficient

18. Which level within the milestone do you (educator) think the student reached based on the overall performance in EPA-1? * [🔍]

Early

The student will choose the milestone that fits the overall performance in the task and the level within the milestone (early/mid/high), then the clinical educator will rate the performance in the same way. This is a subjective, holistic assessment.

19. Student self-reflection on feedback received and next steps * [🔍]
Enter your answer

20. Student declaration: I confirm that I have checked the contents of this form with my assessor prior to submission and they have approved it * [🔍]
 Yes

21. How much time did it take to complete this assessment? * [🔍]
Enter your answer

Send me an email receipt of my responses

Fill in the self-reflection from the experience, feedback provided and possible steps to improve in future clinical tasks (free text). The next question is a declaration that the assessment has been filled in between the student and the clinical educator. The last question is about the time involved in the assessment, then it can be submitted!

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