An update about the new Massey BVSc curriculum

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Curriculum review

Veterinary programme accreditation requires regular review of the curriculum which we have always done. There is often minor adjustment every few years to some courses but then every 5-7 years there is a complete review of the curriculum. The review may find that not much needs to change. From late 2018 we started to discuss curriculum review with the faculty. At a similar time, the Competency-Based Veterinary Education (CBVE) model was launched. After attending an introductory 2-day workshop in 2019, the CBVE approach was discussed with staff and the decision was made to use the CBVE framework for the curriculum review. Unfortunately, COVID struck and halted progress whilst the focus was moving online and training veterinary students under restrictions etc.

Curriculum revision resumed in earnest from early 2021. Part of that development included consulting with the profession in New Zealand and with stakeholders (farming and pet ownership groups, veterinary employers and graduates) as well as the Ministry of Primary Industries, the Veterinary Council of New Zealand and the New Zealand Veterinary Association.

Alongside starting the curriculum revision, through the early 2020s there were two other major projects underway:

- a rebuild of the Veterinary School facilities (including removal of the vet tower) and
- an increase in class size from 130 to 175 subsequent to an increase in the number of places funded by government.

The new curriculum was rolled out with the first intake of the larger class in 2023. The new BVSc2 is being taught this year and the new BVSc5 will be implemented in 2027 with graduates of the new curriculum finishing in late 2027.

What is CBVE?

The traditional curriculum and assessment has often focused on “what do students know”, whereas in a competency-based curriculum we ask **“what can students DO with what they know”.** Students will still absolutely need content knowledge, but there is less emphasis on the minutiae and more on their understanding and ability to integrate and utilise the knowledge.

Competency-based education for medical student training has existed for the past 20-30 years. As a result, some countries and many individual institutions have a separate competency framework for medical education. In 2015, a group of veterinary educators from the USA, Europe, UK and Australia were exploring competency education and decided to collaborate to develop a competency framework for veterinary education globally, rather than at the level of individual institutions. Since its inception, the CBVE project has now become an official American Association of Veterinary Medical Colleges (AAVMC; an international organization despite its name) initiative. Massey University has had several faculty serve on the CBVE sub-committees that have refined the CBVE framework and approach.

In the CBVE framework, there are 9 Domains of Competence (Figure 1) and 32 competencies within these domains. A second version of the international framework has recently been released, and excellent resources about CBVE can be found at https://cbve.org/

Figure 1. The AAAVMC CBVE Domains of Competence.

How is the CBVE framework being utilised?

The framework sits at a high level and provides fixed domains and competencies with flexibility for veterinary programmes to tailor the framework to meet the needs of their institution at the level of the subcompetencies. An example is provided below of the expectations of a BVSc student at the end of each year to enable them to reach a specific subcompetency by the end of their final year (BVSc5) (Table 1).

Table 1. An example of a subcompetency for physical examination tailored to the Massey BVSc curriculum.

Domain 1	**Clinical reasoning and Decision Making** The graduate demonstrates critical thinking and problem solving to arrive at evidence-based decisions that consider animal and client needs, available resources, and social context.
Competency 1.1	***Gathers and assimilates relevant information about animals***
Subcompetency 1.1B	Performs a physical examination in a logical, fluid sequence in common domestic animals and records findings.
End of BVSc5: Performs a physical examination in a logical, fluid sequence in common domestic animals and records findings.	
End of BVSc4: Performs a physical examination on a live dog and cow that follows a logical pattern. Identifies major abnormalities and records findings.	
End of BVSc3: Performs a physical examination of a live animal (including distance and environment where appropriate) that follows a logical pattern. Identifies major abnormalities and records findings.	
End of BVSc2: Performs components of a physical examination on a live animal or model. Differentiates normal from abnormal parameters. Records findings.	
End of BVSc1: Identifies anatomical landmarks relevant to a physical examination in common domestic species. Catches, handles and restrains animals safely and with regard to animal welfare.	

Assessment strategy

Assessment is an essential part of learning. Assessment in a competency-based curriculum looks different from traditional high-stakes university tests and exams, which are primarily about assessing each student's knowledge base.

In an outcomes or competency-based programme, we are still interested in the development of each student's knowledge base, but we are even more interested in what they can do with their knowledge and skills. At the same time, we want the students to see assessment as a part of their learning, not just a hurdle to be cleared.

Traditionally, we taught 'stuff' and then set an exam where students tell us what they have learned (or have rote-learned to regurgitate during an exam). This is assessment **of** learning. Assessment **of** learning is useful for finding out what facts students know, but often isn't much use for helping them understand the content.

In a CBVE curriculum, we undertake some assessment of learning. But we also include assessment **for** learning. For example, we often use online lessons as opposed to lectures for content delivery, because that way we can include questions for students to engage with individually as this reinforces student learning. Model answers provide feedback that they're on the right track. The assessment (question) and feedback helps students to learn.

Sometimes we use even assessments **as** learning - that's when the assessment becomes the learning activity. For example, the weekly quizzes test knowledge of facts and concepts and enable the teaching staff and the students to see what they do or don't know. The act of trying to retrieve the knowledge from the brain actually strengthens neural connections and improves the way that students learn in the future, even when they get the question wrong.
Multiple assessment opportunities are available for students to participate in each semester. Each of these assessments corresponds to one or more of the learning outcomes and subcompetencies for that semester.

Completion of an assessment provides the staff and students with feedback about the level of understanding. Each assessment provides staff with a data point that we can use to form a

picture of each student's progression. Think of each assessment as a pixel - on its own, it's not that meaningful, but when multiple pixels are put together, an image starts to emerge. The more pixels there are, the better the quality of the image. Similarly, the more assessments that are completed, the more confident we can be about the quality of our decisions about each student's progression.

At the end of each semester, a committee of staff (composed mostly of staff who do not teach into that part of the course) will meet to consider each student's progress. Supplementary exams will no longer be offered but any student that is close to meeting all the learning outcomes for the course will be given a further two-week period (at the end of each teaching semester) to demonstrate that they have now met the learning outcomes and may progress in the course. Any student that can't meet the learning outcomes for that semester's course will need to take time out from study and then repeat that semester the following year.

As you might imagine from the description of assessment above, the revised assessment strategy for competency assessment doesn't align well with a traditional alpha grading system (A+ to Fail). Consequently, in the new curriculum we have adopted a pass/fail system.

Assessment - pass/fail

Most medical schools globally and an increasing number of veterinary schools are using or moving to pass/fail grading. The key drivers are benefits to students in terms of wellbeing, self-regulation / intrinsic motivation for learning, and an improved learning environment.

Common concerns about a pass/fail grading system

Won't moving to pass/fail result in a "dumbing down" of students?

There is a common misconception that pass/fail grading means a 50% pass mark. In a pass/fail system, we get to determine what constitutes a pass for our courses and don't have to follow the standard university 50% pass mark associated with letter grading. The veterinary schools in the US that we have been talking to that use pass/fail for the entirety of their curriculum have required pass marks around 65-80%.

Will pass/fail grading result in lower student performance?

The evidence suggests it does not. In comparing letter-graded and pass/fail graded cohorts, no difference was found in either academic performance or attendance at academic activities. Several studies have reported no difference in the licensing exam results after moving to binary pass/fail grading compared to previous cohorts of students.

Will pass/fail grading hinder students' future progression to post-grad/residencies?

The evidence suggests it does not. Of the two veterinary schools that have had pass/fail the longest, neither report any decrease in students progressing to residencies or post-graduate study. From the medical education literature, no differences in success in residency placement between letter graded and pass/fail graded cohorts have been found.

Integrated learning

A major part of the change in our philosophy was wanting to break down the siloed approach that was driven by multiple 15-credit courses taught in the same semester. With little or no coordination between courses, students often didn't see the linkages and importance of the content. Rather than studying to understand and integrate the content as it might be needed in their future career, this system encouraged them to just study to "pass the exams" for each course.

To combat this siloed approach, in the new curriculum there is a single course per semester, and the content will be delivered in a more integrated fashion with four strands in each course and throughout the new curriculum.

- **Animals, people and the environment (APE):** veterinarians are primarily interested in keeping animals healthy and productive, but animal health, human health and environmental health are all interconnected, so veterinarians work in that intersectional space. For example, vets play an important role in public health by monitoring and controlling the spread of diseases that are transmissible between animals and people.
- **Clinical skills (CS)** - there are many technical skills associated with clinical veterinary work, such as placing intravenous lines or performing surgery - these are mostly associated with Domain 2 in the CBVE Framework.
- **Clinical reasoning (CR)** - this is where you'll find the 'ologies' and teaching relevant to the clinical day-to-day work of a veterinarian that relates mostly to Domains 1-4 in the CBVE Framework. It is about:
    - Gathering information, defining problems, forming hypotheses and formulating plans to test the hypotheses
    - Formulating management, treatment and monitoring plans.
    - Designing preventive health plans to keep animals healthy.
- **Professionalism and Communication (PaC)** – this was already a component of our curriculum but based on feedback from the profession we are placing even more emphasis on it in the new curriculum. Being able to communicate well with others and establish effective relationships with colleagues and clients is critically important to student success at vet school and in their future career. These skills relate to Domains 5-8 of the CBVE Framework.

Course structure

Having a single course per semester and the lack of large high stakes mid-terms or final exams, facilitates programmatic assessment. Without final exams, we have taken the opportunity to utilise the semester time more effectively to spread both student and staff workload. For the years BVSc2 to BVSc4 in the new curriculum, there are 14 teaching (and standard assessment) weeks. It is important to note that this does not mean adding more content, but rather spreading content out a little more to allow students time for the assimilation of content and to prepare for and participate in assessments. As such, it looks different to a traditional teaching term, but in terms of workload for both staff and students it should be substantively similar to the previous curriculum.

Instead of high stakes supplementary exams in the last week of January for failed courses from Semester 1 and 2 in the previous year, we offer remediation for students who need it immediately following each semester. Students who do not pass will not progress to the next semester and will repeat the semester the following year.

Summary

As has been described above, it has been and continues to be a time of marked change for the Massey BVSc curriculum. In summary those changes are:

- Moving to a competency-based curriculum
- Moving to programmatic, pass/fail assessment strategy with assessment for and as learning
- Moving to a more integrated curriculum with one course per semester

Our aim is that the graduates of the new curriculum will be more practice ready and have the skills to be lifelong learners who are adaptable to the profession.

Further reading

CBVE resources:

General introduction https://cbve.org/
Updated documents (framework, milestones and entrustable professional activities)
https://cbve.org/cbve-20
Information about Programmatic Assessment (Maastricht, medical training, 12 minutes)
https://www.youtube.com/watch?v=rs246fdAmVM&t=107s