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Undergraduate veterinary education☆

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ABSTRACT

When planning a veterinary curriculum the following aspects must be considered: The changes and challenges in the profession? How long should it take to train a veterinarian? How much repetition or reinforcement should the curriculum contain? Is every component of the curriculum relevant and is the inclusion justified? Are students just being lectured to or are they being educated? Is the assessment relevant? Are graduates made to fit (all employment sectors and ideally possibly internationally)? Educators must critically evaluate their personal pedagogy. Do students see a module as another hurdle to conquer in an overloaded course to obtain the ticket to enter the profession or do they realise how relevant the module is?

1. Introduction

The veterinary profession is very diverse. Graduates are employed by the state and private sectors. In both sectors there are opportunities to work with companion animals, production animals and wildlife.

There are many facets to successfully educating veterinarians:

1. The selection of students should include the following criteria:
- knowledge of the profession in all its facets
- passion to become a veterinarian
- integrity towards the profession and clients
- intellectual quotient (IQ)
- emotional quotient (EQ)
2. Needs of the profession:
- predictions of how veterinary science will develop in the next 10–20 years
- what the country and its communities require with regards to veterinary services
3. A well planned curriculum must:
- be outcomes based
- ensure limited or appropriate repetition between subjects
- include subjects dealing with professional life and health
- encourage self-driven (guided) learning
- allow for peer instruction
- have carefully planned lecturer/student contact time
- use relevant assessment to drive learning and can include computer based, group and peer assessment
4. Appropriate use of technology:
- this facilitates communication with students
- encourages illustration during instruction
- uses case studies
- a computer laboratory is a key requirement
- skills laboratories will streamline skills acquisition
- assessment must be appropriate

2. Discussion

Little has changed within the classroom since the first university in the western world was started in Bologna in

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1088. The painting of a scene by Laurentius de Voltolina depicting a classroom from that era illustrates that during a lecture a few students were sleeping, a few were talking to each other while some were or seemed to be paying attention. The class appeared to be well attended. Today, absent students may be sick or may have decided the lectures are a waste of time. Technology (photocopy machines, audio visual recording machines and computers) aids absenteeism. Some students may elect to surf the world wide web or search the library for information on the lecture topic that may be relevant.

A well planned curriculum should not allow for too much duplication but rather facilitate reinforcement except for the necessary continuity between subjects. Students should not be forced to memorise information readily available via technology. I hate hearing: "I had to suffer doing this as a student so my students must also suffer. . .". If the information is really important, it will automatically be remembered because of regular use.

A veterinary curriculum traditionally consists of a pre-clinical component followed by a clinical component. The pre-clinical component is mainly theoretical with minimal exposure to practical/clinical aspects. The clinical component has increasing practical/clinical aspects with greatly reduced theoretical input – with the final year being almost solely clinical.

Students are exposed to technology during clinical years at most veterinary faculties which includes diagnostic equipment, skills laboratories and operating rooms. This technology also facilitates research required from academic staff. Some of this equipment may have been purchased via research grants. Research is an income generating avenue for universities.

Unfortunately, preclinical education frequently involves educators merely down-loading facts in point form for students to memorise via teaching aids such as overhead projectors, slide projectors and Microsoft PowerPoint. Often reluctance to radically modify the preclinical training is because:

- these methods worked for decades i.e.: pedagogy lecturers received
- students are accustomed to being spoon-fed, facilitating easy recall from short-term memory and resultant good grades
- funding to upgrade/modify lecture facilities is a problem
- funding/remuneration formulae at tertiary institutions is pushing educators to become researchers, resulting in less time spent planning and preparing for educating

A consequence of this is that students may have difficulty adapting from cramming theoretical facts in the preclinical courses to techniques more often used in the clinical years requiring understanding, reasoning, synthesising, decision making and implementation.

Fig. 1 has been constructed assuming that following a theoretical module presented in the form of lectures, a student will retain 30% of the information presented in long term memory (TR) while a practical/clinical module will result in approximately 70% of the information being retained in long term memory (PR). The summation of the information retained in long term memory for theoretical and practical/clinical components for each year results in the line (Sum). This illustrates the necessity for educators to utilise and apply appropriate innovative techniques to maximise long term memory retention throughout the curriculum.

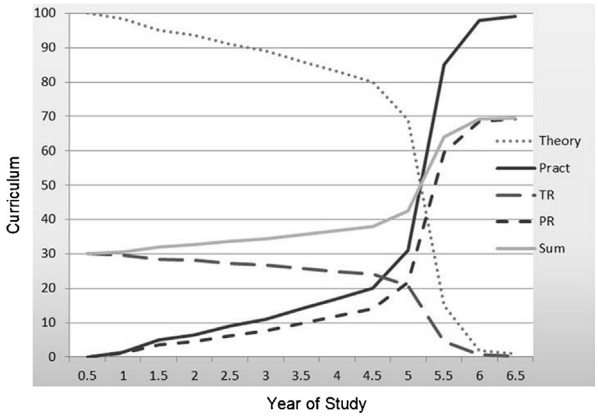

Fig. 1. Hypothetical 6.5 year undergraduate veterinary curriculum and memory retention of content. Theory = % of curriculum based on theory; Pract = % of curriculum based on practical/clinical exposure; TR = theoretical content retained to memory (assuming 30% is retained); PR = practical/clinical content retained to memory (assuming 70% is retained); Sum = summation of retention to memory of the theoretical and practical content.

Peer instruction is a useful tool that can be utilised but must be implemented correctly. As with any change, resistance is likely from students and staff. Effort must be invested in motivating students to participate and training staff to be proficient in peer instruction. A lot of determination and planning is necessary from the educator and the student is required to prepare for the session by reading or listening to or watching audio-visual material. If this is not done, there will be minimal benefit! Appropriate ConcepTests are essential for success. They should be designed to give students a chance to explore important concepts, rather than testing cleverness or memory, and to expose common difficulties with the material (Crouch and Mazur, 2001). In a survey where more than 700 instructors participated, 384 of whom were identified as using peer instruction, results indicated that most of the assessed peer instruction courses produce learning gains commensurate with interactive engagement pedagogies, and more than 300 instructors (greater that 80%) consider their implementation of peer instruction to be successful. Over 90% of those using peer instruction indicated that they will continue or will expand their use of peer instruction (Fagan et al., 2002).

An added advantage of peer instruction is that it has been shown to reduce student attrition in science programmes (Lasry et al., 2008).

Once implemented, student reaction is generally positive (Crouch and Mazur, 2001).

All educators would like their "pearls of wisdom" to be retained in long term memory. Part of the problem could be related to what was termed "disuse atrophy" when