

## **New Teaching Methods**

### **Success stories in new educational methods that show positive outcomes**

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It is a challenge to evaluate in a scientific way if changes in a veterinary curriculum lead to improved quality of veterinary services. Educational research is different from biomedical research in several ways (e.g. no double blind experiments are possible; difficult to define reliable control groups), so evidence for the effect of new teaching methods is sparse. Retrospective studies and design-based research are well suited to find evidence for positive outcomes. Competency frameworks (RCVS Day 1, OIE Day 1, VetPro of Utrecht University) as the base for Outcomes, which were developed in the past decades, are discussed with specific attention for the competency framework of the Veterinary Professional (VetPro)<sup>1</sup>. The VetPro competency framework is based on a multi-method qualitative and quantitative research. A first draft was developed, based on the data of 6 focus groups (young veterinarians and clients). This draft competency framework was validated by a Delphi procedure, with an expert panel of 29 stakeholders (veterinarians and non-veterinarians)<sup>2</sup>. An international online questionnaire with 1137 participants (veterinarians) completed the study<sup>3</sup>. The VetPro consists of 7 competency domains (Veterinary Expertise, Health and Welfare, Scholarship, Communication, Collaboration, Entrepreneurship, Personal Development), with 18 underlying competencies, and shows the necessity of integration of competencies and the generic and specific aspects of competencies. Visualisation of the VetPro elucidates the integrative approach and the usefulness for a lifelong learning approach (Fig.1). The Veterinary Professional is the end result of well-developed competencies in the 7 domains. Based on such a competency framework, more detailed program outcomes can be described, which can be translated into learning objectives for all curriculum subjects.

Characteristics of Competency-based Education (CBE) are: commitment to outcomes (which leads to an emphasis on abilities, more than on pure knowledge), learner-centeredness, active learning methods, focus on feedback and formative assessments, and the promotion of lifelong learning.

A meta-analysis in medical education found that passive didactical formats, like lectures, were negatively related to graduation rate, and that an optimum percentage of contact hours is 25 %, which means 10 hours teacher-student contact within a week of 40 hours<sup>4</sup>. The structure of the veterinary curriculum should foster the development of the above-mentioned competencies in the veterinary student. Based on educational theories, especially social constructivism, a variety of models to deliver healthcare curricula have been developed, such as problem-based learning, team-based learning and workplace learning.

In veterinary education more often a kind of 'hybrid' curriculum is developed, in which student-centred, activity stimulating teaching methods are introduced, by which learning is fostered. For example, small-group learning formats will foster active learning in theoretical courses. An ideal format for theoretical courses is: 1) description of learning objectives, 2) some introductory lectures (presenting an overview and elucidating difficult topics,) 3) self study, 4) small group learning (seminars, tutorials, workshops, practicals), 5) self-study, 6) assessment (which is in line with the learning objectives). The (clinical) workplace is an ideal environment for active learning.

Addressing relevance of what students are asked to learn, and focusing on relevant content will foster motivation and thus learning. Relevance can be realised by integration of real life, clinical and non-clinical, topics taken from the competencies into the basic science disciplines and by addressing topics from the basic sciences in the clinical workplace, thus reaching vertical integration in the curriculum.

The competency scholarship can be addressed in an active way, for instance by group tasks from year one on through evaluating evidence for relevant diagnostic or therapeutic topics, and by evidence-based case-reports during clinical rotations. Working together in small groups on specific tasks helps students to develop communication and collaboration competencies and problem-solving skills.

A CBE curriculum needs a variety of assessment tools, for the different competencies and specific skills. Workplace learning is particularly suitable for an integrative approach of all competencies. In order to maximise opportunities of workplace learning, frequent formative feedback must be provided on all competencies to ensure learning is inseparable from assessment. A well-proven system of a longitudinal learning and assessment program in the clinical workplace is described, in which different feedback and assessment tools are implemented: Mini-CEX (mini-clinical examination), multisource feedback (MSF), evidence-based case reports (EBCR) and personal development plans (PDP). Students are responsible themselves to collect adequate feedback (meaning from a variety of supervisors, including peers, on a variety of activities and addressing all competencies) with these 4 tools, which can be valued as formative assessment data. All feedback is loaded in an electronic 'learning and assessment' portfolio. At three specific time points all feedback is aggregated, so the competency development of that specific student is visualised and can be compared to the competency development of the whole cohort. An assessment committee is responsible for the summative assessment, declaring a student ready for graduation or not. Implementation and evaluation of this totally new master-program in veterinary medicine was monitored, using the method of a development study.

The competency 'personal development', in which personal resources such as reflective skills, pro-activity and self-efficacy are taught, practised, and refined, is crucial for the professional development of students and young graduates, and their wellbeing and work engagement will be enhanced. Individual mentoring and peer-feedback meetings are supportive for the personal development of the student. By using personal development plans (PDP) as part of the assessment system, reflection within the student will be fostered. High quality and frequent feedback is a prerequisite to foster learning and to make reflection possible.

Overall a competency-based program will foster the learning of students by these four specific objectives: Feedback, Activity, Individualisation and Relevance for outcomes, which forms the acronym: be FAIR to your students<sup>6</sup>.

A training program for veterinary educators is essential to ensure teachers develop appropriate feedback skills to enhance student learning and to practice active teaching formats and individual mentoring skills, all of which are necessary for the integrative development of all competencies in the veterinary student.

**Figure 1: Visualisation of the competency framework for the Veterinary Professional (VetPro)**



1. Martin A Cake et al.; BEME Guide, Medical Teacher 2016; 38(6): 550-563
2. Harold GJ Bok et al.; JVME 2011; 38(3): 262-269
3. Harold GJ Bok et al.; JAVMA 2014; 245(8): 906-913
4. Henk G. Schmidt et al; Higher Education 2010; 60: 287-300
5. Cees PM van der Vleuten et al.; Medical Teacher 2012; 34(3): 2015-214
6. Ronald M. Harden and Jennifer M. Laidlaw; Medical Teacher 2013; 35: 27-31