Curriculum Design, Revision & Reform

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January 19th, 2018

Today's Agenda

- **Curriculum Design, Review & Reform**
  - ✓General Principles
- **Experiences from a curriculum review and reform at Virginia Tech**
  - ✓The good, the bad and the ugly!

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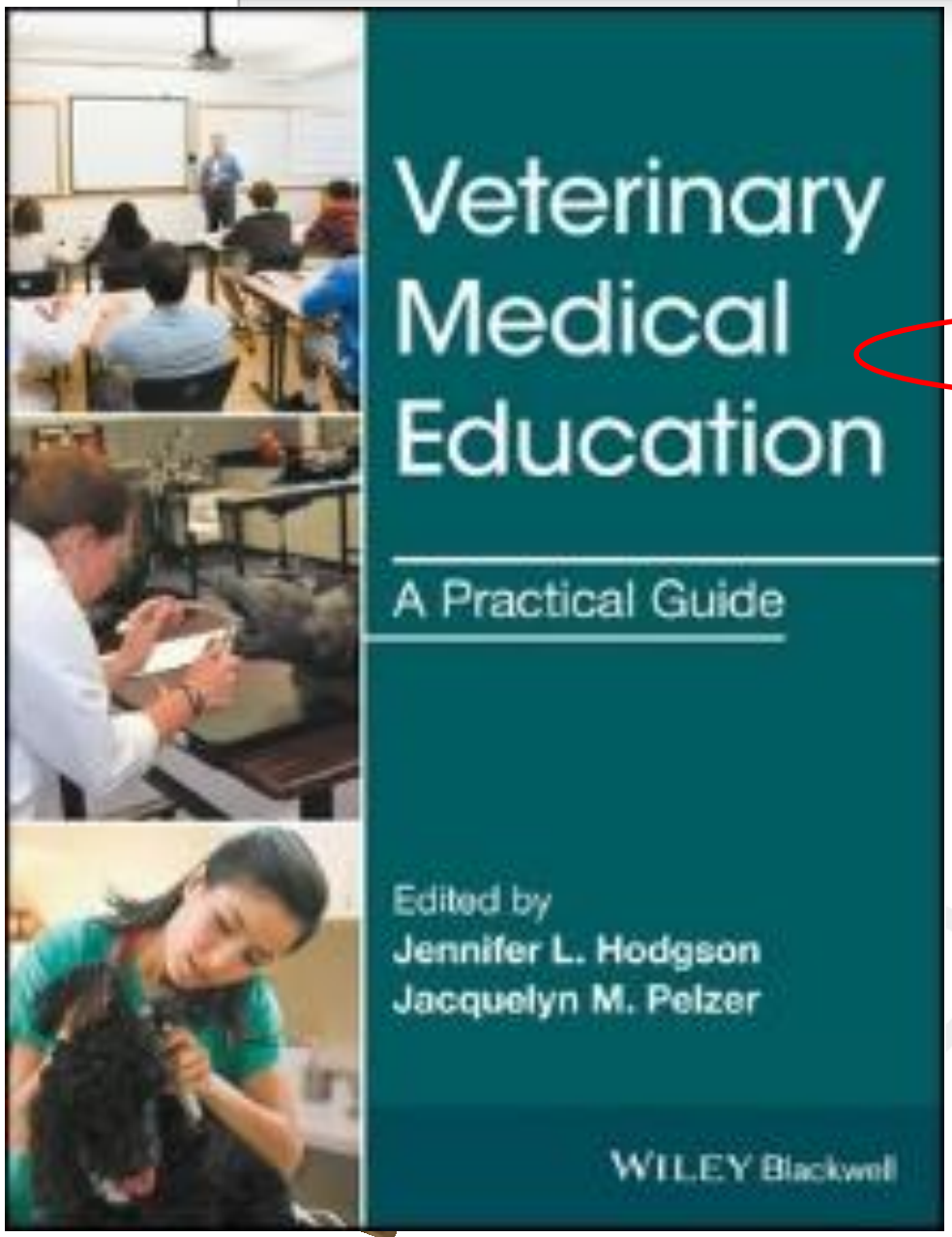
CURRICULUM DESIGN

WHAT AND WHY?

Curriculum Design



Contents

Curriculum Design

Key Messages

- Modern veterinary curricula should focus on the fundamental skills required of all graduates and incorporate the principles of learning that will achieve these.
- A curriculum should be designed to be the best fit for the purpose and context of its place and time.

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Curriculum Design

Key Messages

- A curriculum is the totality of student experiences that occur in an educational process, including not only what is taught, but how it is taught, learned, and assessed, how the learning is managed and communicated, and the overall learning environment.

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Curriculum Design

Key Messages

- Curriculum design, review, and reform are complex processes that should involve **well defined steps** and **input from a wide variety of stakeholders**.

So what are those steps?

Curriculum Design

- **Step 1: Identify the Overall Purpose of the Educational Program**
- **Step 2: Determine the Specific Student Learning Outcomes or Competencies**
- **Step 3: Determine the Content to Be Included**
- **Step 4: Determine the Organization of the Content, Including the Sequence in Which It Is Covered**
- **Step 5: Determine the Educational Strategies or Learning Methods**

Harden, R.M. (2013) Curriculum planning and development, in *A Practical Guide for Medical Teachers*, 4th edn (eds J.A. Dent and R.M. Harden), Churchill Livingstone, Edinburgh, pp. 10–16.

Curriculum Design

- **Step 6:** Determine Learning and Teaching Methods
- **Step 7:** Determine How the Student's Progress Will Be Assessed
- **Step 8:** Communicate the Curricular Design and Principles to All Stakeholders, Including Students
- **Step 9:** Include Consideration of the Educational Environment
- **Step 10:** Determine How the Curriculum Will Be Managed, Including Resource Allocation

Curriculum Design

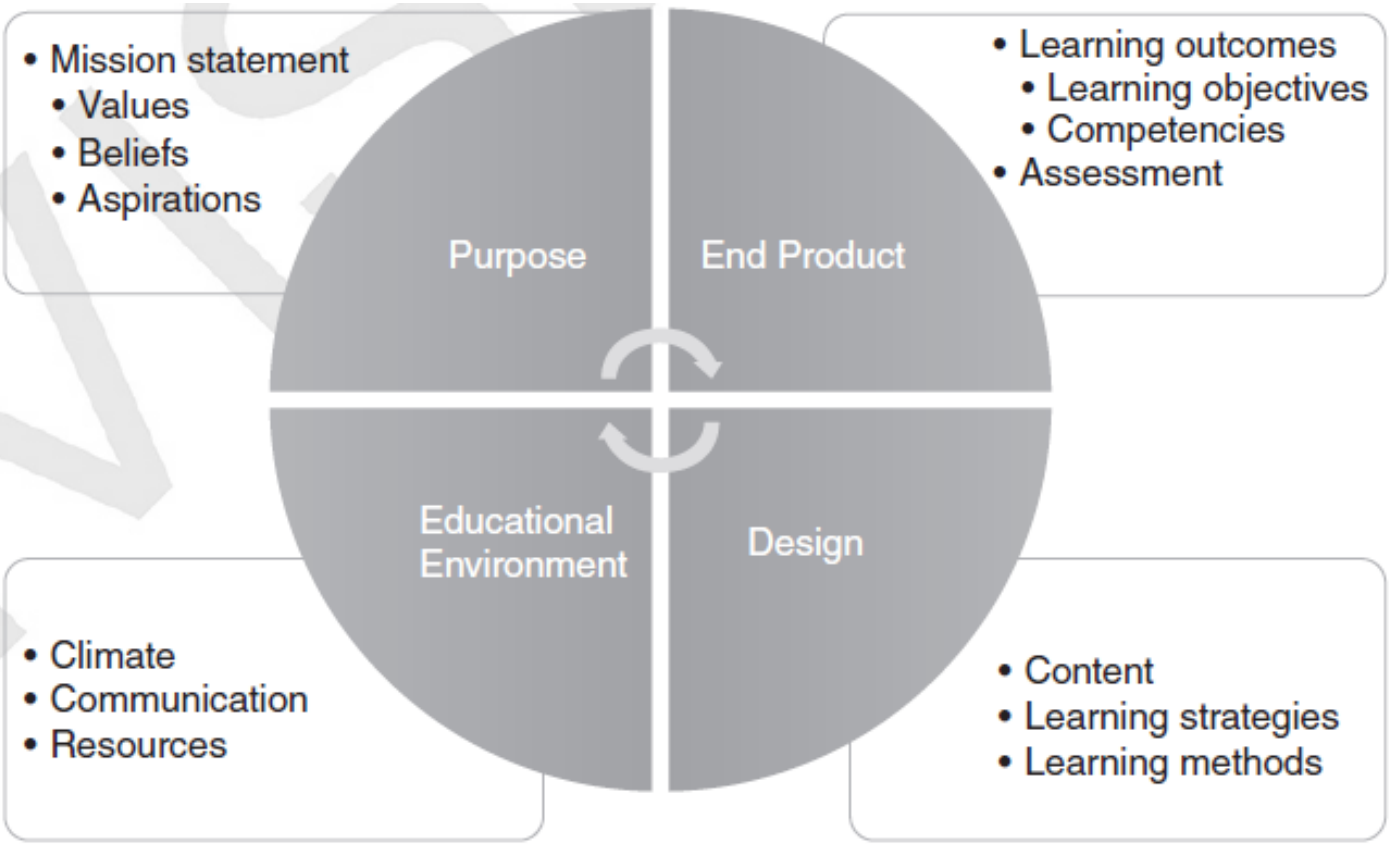

Figure 1.1 Curricular elements.

Curriculum Design

Table 1.1 Factors influencing curricular design and their effects.

Factor	Specific Influence	Effect
Academic	Theories of learning	Learner-centered design (e.g., problem-based learning); integrated curricula
	Expansion of knowledge	Core and elective curricula
	Decreasing resources	Distributed clinical teaching
Professional	Veterinary practitioners	Inclusion or expansion in the curriculum for communication and business skills; emphasis on teamwork and professionalism
	Accreditation and licensure	Outcomes-based curricula; focus on competencies; changes to curricula due to changes in licensing exams, e.g., North American Veterinary Licensing Examination (NAVLE)
Societal	One Health	Multiprofessional elements
	Social values	Widening-participation curricula to address underserved areas or communities; fewer animal use courses and introduction of clinical skills laboratories
Political	Length of curriculum	Shorter curricula, or earlier entrance to Doctor of Veterinary Medicine programs, to address cost of veterinary education

Source: Adapted from Grant (2013). Reproduced with permission of Wiley Blackwell.

CURRICULUM REVIEW & REFORM

WHAT & WHY?

Curriculum Review & Reform

Background Theory: Jan Ilkiw

- Change in medical education has been described as neither enduring nor certain (Shuster and Reynolds, 1998)
- The widely used phrase "reform without change" has represented the outcome of many medical education reform efforts! (Matson *et al*., 2013).

But change is hard!!!!

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Curriculum Change

Why is change so hard?

"I want you to find a bold and innovative way to do everything exactly the same way it's been done for 25 years."

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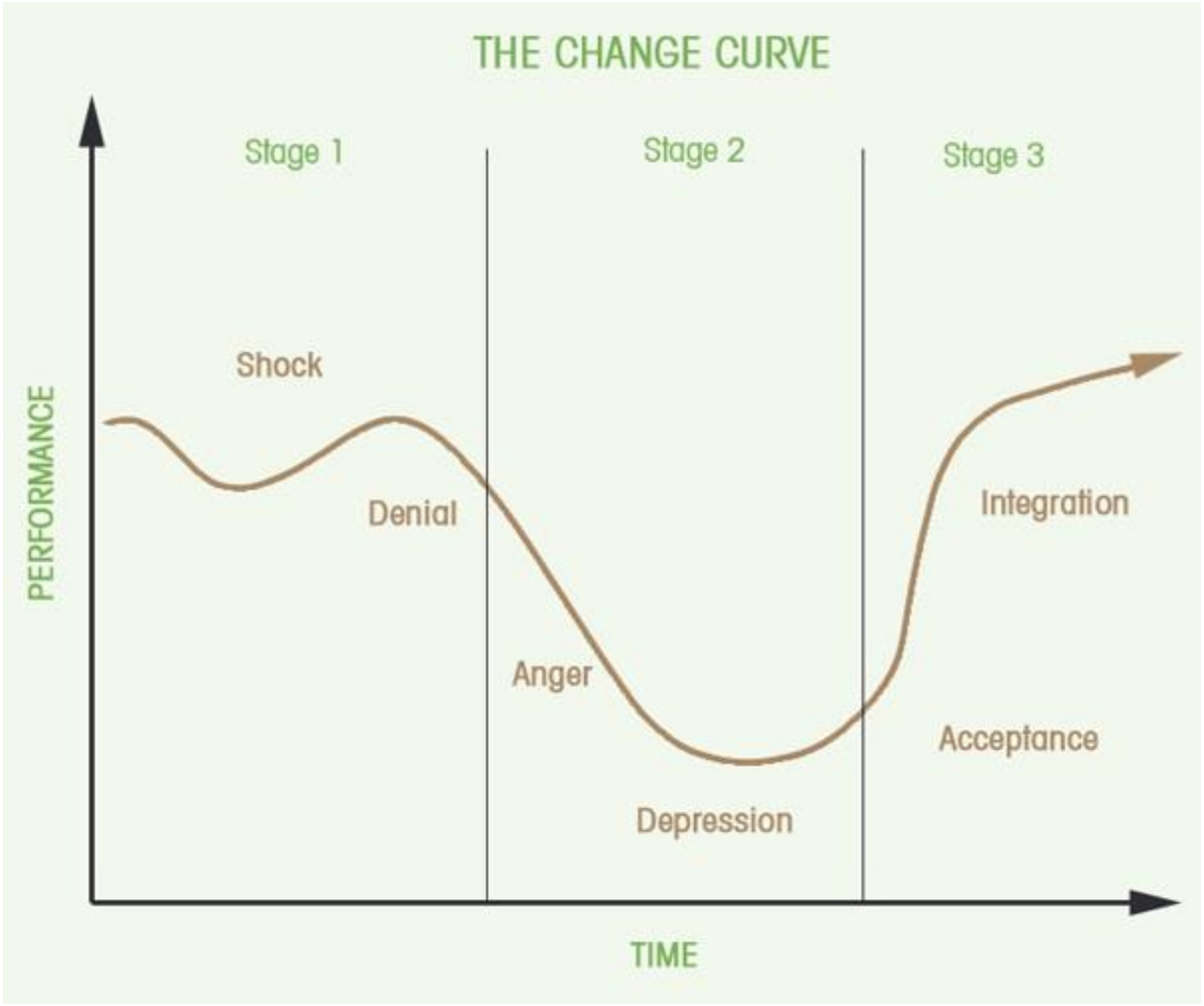
Curriculum Change



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Curriculum Review & Reform

Background Theory: Jan Ilkiw

- One study looked at the (diverse) literature and found a **consistent set of characteristics** associated with successful curricular change:
  - ***Context***, which included characteristics present in the organization that facilitated change. Factors discussed in this cluster were mission and goals, history of change in the organization, politics, and organizational structure.

Bland, C.J., *et al* (2000) Curricular change in medical schools: How to succeed. *Academic Medicine*, **75**, 575–594.

Curriculum Review & Reform

Background Theory: Jan Ilkiw

- One study looked at the (diverse) literature and found a **consistent set of characteristics** associated with successful curricular change:
  - ***Curriculum***, which included characteristics pertinent to the curriculum itself. Factors discussed were the need for change and the scope and complexity of the innovation.

Curriculum Review & Reform

Background Theory: Jan Ilkiw

- One study looked at the (diverse) literature and found a **consistent set of characteristics** associated with successful curricular change:
  - ***Process,*** which included characteristics that relate to the process of implementing curricular change. Factors discussed were cooperative climate, participation by organizational members, communication, human resource development, evaluation, performance dip, and leadership.

CURRICULUM REVIEW & REFORM

EXPERIENCES FROM VIRGINIA TECH

Curriculum Review & Reform @ VT

- The process for us began in **August, 2013** with a 2 day workshop for a 20 person working party tasked with curriculum review and potentially reform
- This working party developed a **proposed new DVM curriculum**, which was subsequently approved by a faculty vote
- In **August, 2016** we began the new DVM curriculum with the Class of 2020!

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Curriculum Review & Reform @ VT

- Discuss our review by going through the **Harden's 10 steps of curriculum design**
- "Although these steps are discussed serially, in real life many of the **decisions occur in parallel, or in a different order**. This rearrangement is acceptable, as the steps are ultimately interdependent and the timing of their development may be a function of the college or school's needs or resources."

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Curriculum Review & Reform @ VT

Step 1:

- **Identify the Overall Purpose of the Educational Program**
  - ✓Can be through a **mission statement**, expressing values, beliefs, and aspirations for a program
  - ✓Should be shared values that are defined and specific
  - ✓Should not be vague/meaningless "curriculum that produces a good veterinarian"

Curriculum Review & Reform @ VT

Step 1: VM CVM

- **Identify the Overall Purpose of the Educational Program; VM CVM Mission Statement**
  - ✓ Relative to all other missions of the College, the educational needs of veterinary students come first.
  - ✓ Instruction and assessment will be informed by research supporting effective student learning and be aligned with our educational principles and expected Day-1 competencies.

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Curriculum Review & Reform @ VT

Step 1: VM CVM

- **Identify the Overall Purpose of the Educational Program: VM CVM Mission Statement**
  - ✓ Curricular content will be integrated horizontally and vertically to facilitate acquisition of knowledge and development of skills necessary for solution of complex problems involving multiple disciplines and subject areas.
  - ✓ Emphasis will be placed on experiential learning throughout the four years of the curriculum.

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Step 1: VM CVM

- **Identify the Overall Purpose of the Educational Program: VM CVM Mission Statement**
  - ✓In addition to mastering the core competencies expected of all graduates of the VMRCVM, students will be given substantial opportunity to specialize in areas of individual interest.
  - ✓The curriculum will promote life-long learning and development of critical thinking skills.

Curriculum Design

Step 2:

- **Determine the Specific Student Learning Outcomes or Competencies**
  - ✓Backward designed curricula so that they are focused on outcomes rather than inputs
  - ✓= Competency-Based Veterinary Education

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Curriculum Design

Step 2: VMCVM

- **Determine the Specific Student Learning Outcomes or Competencies**

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Curriculum Design

Step 2: VM CVM

- **Determine the Specific Student Learning Outcomes or Competencies**
  - ✓ But we are subsequently **mapping our curriculum** to determine if our "outcomes" are included
    - AAVMC and AVMA competencies – **NOT EASY!!!**
    - Species/systems/topic areas (NAVLEs practice analysis/blueprint)
  - ✓ Also will **assess these outcomes** and if not achieving will use this information to revise

Curriculum Design

Step 3:

- **Determine the Content to Be Included**
  - ✓Core, Track and Elective
  - ✓Content Overload
  - ✓“Just in Case” versus “Just in Time”

Curriculum Design

Step 3: VM CVM

- **Determine the Content to Be Included**
  - ✓Maintained our **core/track/elective curriculum**, but:

	OLD DVM curriculum	NEW DVM curriculum
Year 1	core/elective	core
Year 2	core/track/elective	core
Year 3	core/track/elective	track/elective
Year 4	core/track/elective	core/track/elective

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Curriculum Design

Step 3: VM CVM

- **Determine the Content to Be Included**
  - ✓ Have tried to address **content overload** and **"just in case" versus "just in time"** teaching by restricting the number of contact hours in the new courses in the first two years of the curriculum
    - **Maximum of 25 contact hours average over the length of the course**
    - "helps" faculty focus on "threshold concepts" and "what is important/common" not "what they might see (maybe)"

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Curriculum Design

Step 4:

- **Determine the Organization of the Content, Including the Sequence in Which It Is Covered**
  - ✓Modular Curricular Design
  - ✓Integrated Curricular Design
  - ✓Spiral Curriculum

Curriculum Design

Step 4: VM CVM

- **Determine the Organization of the Content, Including the Sequence in Which It Is Covered**
  - ✓Our **biggest change** as we moved from the more traditional modular design to a horizontally and vertically integrated curriculum
    - ✓**Horizontal integration** – integration of basic or clinical sciences within a timeframe e.g., anatomy & physiology of the respiratory system within the same week

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Curriculum Design

Step 4: VM CVM

- **Determine the Organization of the Content, Including the Sequence in Which It Is Covered**
  - ✓Our biggest change as we moved from the more traditional modular design to a horizontally and vertically integrated curriculum
    - ✓**Vertical integration** – integration of basic and clinical sciences within a timeframe e.g., anatomy & radiology of the respiratory system within the same week

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Curriculum Design

Yr	Fall		Winter	Spring		Summer
1	The Normal Animal	Dealing with Threats	Free	Moving and Sensing		Free
	Becoming a Professional I			Becoming a Professional II		
2	Eating & Eliminating	Breathing & Circulating	Free	Reproducing	Healthy Populations	Clerkships (5 - 3 week blocks)
				Becoming a Professional III		
3	"Advanced Courses (Track/Elective)		Free	"Advanced" Courses (Track/Elective)		Free
4	Clerkships (12 – 3 week blocks)					Graduated!

This structure also helps a **spiral curriculum design** as the curriculum returns to some core subjects e.g., bacteriology!

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Curriculum Design

Step 5:

- **Determine the Educational Strategies or Learning Methods (Harden's SPICES model)**
  - ✓ Student-Centered versus Teacher-Centered Learning
  - ✓ Inquiry-Based Learning versus Information-Oriented Learning
  - ✓ Integration versus Subject- or Discipline-Based Learning
  - ✓ Community-Based Learning versus VTH
  - ✓ Elective versus Core
  - ✓ Systematic versus Opportunistic Approach
  - ✓ **Scaffolded Active Learning in Veterinary Curricula (May & Silva-Fletcher, 2015)**

Curriculum Design

Step 5:

- **Determine the Educational Strategies or Learning Methods (Harden's SPICES model)**
  - ✓ **Scaffolded Active Learning in Veterinary Curricula (May & Silva-Fletcher, 2015)**
    - Veterinary curricular model that promotes effective problem-solving, integrated knowledge, and clinical reasoning.
    - Model is underpinned by 9 pedagogical principles

Curriculum Design

Step 5:

- **Determine the Educational Strategies or Learning Methods (Harden's SPICES model)**
  - ✓ **Scaffolded Active Learning in Veterinary Curricula (May & Silva-Fletcher, 2015)**
    - **Core knowledge** is provided through **framework lectures/labs**, then **additional knowledge** is attained through **context-related problem-solving**, involving **collaborative learning, and case-based exercises**, or self-directed learning.

Curriculum Design

Step 5: VM CVM

- **Determine the Educational Strategies or Learning Methods (Harden's SPICES model)**
  - ✓ **Scaffolded Active Learning in Veterinary Curricula (May & Silva-Fletcher, 2015)**
    - Core knowledge is provided through framework lectures/labs
    - All course in the first 2 years ***MUST*** have **context-related problem-solving sessions (integration sessions)**, involving **collaborative learning (e.g., TBL) through case-based exercises (approved by faculty vote)**

Curriculum Design

Step 6:

- **Determine Learning and Teaching Methods**
  - ✓Lectures and Whole-Class Activities
  - ✓Small-Group activities
  - ✓Self-Directed Learning
  - ✓E-learning
  - ✓Laboratory Classes, Including Animal-Use Courses
  - ✓Learning in Clinical Skills Laboratories and Simulations
  - ✓Learning in Veterinary Teaching Hospitals and Distributed Sites

Curriculum Design

Step 6: VM CVM

- **Determine Learning and Teaching Methods**
  - ✓Lectures and Whole-Class Activities
  - ✓Small-Group activities
  - ✓Self-Directed Learning
  - ✓E-learning
  - ✓Laboratory Classes, Including Animal-Use Courses
  - ✓Learning in Clinical Skills Laboratories and Simulations
  - ✓Learning in Veterinary Teaching Hospitals and Distributed Sites

Curriculum Design

Step 6: VM CVM

- **Determine Learning and Teaching Methods**
  - ✓Learning in Clinical Skills Laboratories and Simulations
    - ✓Expanded in our new curriculum with development of a clinical skills lab
    - ✓Mapping of skills development and teaching through low/high fidelity models before animal use labs
  - ✓Learning in Veterinary Teaching Hospitals and Distributed Sites
    - ✓Developed relationship with Humane Rescue Alliance in Washington DC
    - ✓core off-site clerkship that will replace Sx clerkship at VTH

Curriculum Design

Step 7:

- **Determine How the Student's Progress Will Be Assessed**
  - ✓Blueprint Valid and Reliable Assessments within an Assessment Program
  - ✓Determine the Level of Learning to Be Attained

Curriculum Design

Step 7: VM CVM

- **Determine How the Student's Progress Will Be Assessed**
  - ✓Blueprint Valid and Reliable Assessments within an Assessment Program
    - Have "tried" to do this, but have really struggled!!!
    - Exams (lecture/lab) **every 2 weeks** (much better than the MULTITUDE of exams we had in the old DVM (modular) curriculum)

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Curriculum Design

Step 7: VM CVM

- **Determine How the Student's Progress Will Be Assessed**
  - ✓Blueprint Valid and Reliable Assessments within an Assessment Program
    - MCQ exams are still our primary form of assessment
    - Standard setting has been a big issue! Using a modified Cohen method to adjust scores
    - Including OSCEs in most of the courses in the 1st two years

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Curriculum Design

Step 7: VM CVM

- **Determine How the Student's Progress Will Be Assessed**
  - ✓ Determine the Level of Learning to Be Attained
    - Moved to a **PASS/FAIL system** for all courses and clerkships in the new curriculum (approved by faculty vote)
    - Based on the medical literature
    - Still calculate a **weighted class rank**
    - Working really well so far!

REED, D. A., SHANAFELT, T. D., SATELE, D. W., POWER, D. V., EACKER, A., HARPER, W., MOUTIER, C., DURNING, S., MASSIE, F. S. J., THOMAS, M. R., SLOAN, J. A. & DYRBYE, L. N. 2011. Relationship of pass/fail grading and curriculum structure with well-being among preclinical medical students: a multi-institutional study. *Academic Medicine,* 86**,** 1367-1373.

Curriculum Design

Step 8:

- **Communicate the Curricular Design and Principles to All Stakeholders, Including Students**

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Curriculum Design

Step 8: VM CVM

- **Communicate the Curricular Design and Principles to All Stakeholders, Including Students**
  - ✓Also not easy!
  - ✓Variety of meetings
    - Town hall meeting
    - Department meetings
    - Student forums/class meetings
    - External stakeholders
    - “Brown Bag” lunches

Curriculum Design

Step 9:

- **Include Consideration of the Educational Environment**
  - ✓Hidden Curriculum

Curriculum Design

Step 9: VMCVM

- **Include Consideration of the Educational Environment**
  - ✓ Hidden Curriculum
    - Biggest issue to date has been managing the Class of 2019 at the same time as introducing the new curriculum

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Step 10:

- **Determine How the Curriculum Will Be Managed, Including Resource Allocation**

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Curriculum Design

Step 10: VM CVM

- **Determine How the Curriculum Will Be Managed, Including Resource Allocation**
  - ✓Also somewhat contentious!
  - ✓Course Leaders of new large courses have had a 10% FTE assignment and salary load for 3 years
  - ✓Purchased additional materials for courses e.g., models for clinical skills lab

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Curriculum Design

Last Word: BIGGEST CHALLENGE

- **Show how the new curriculum has improved our student learning outcomes!**
  - ✓ **Compare the old and new DVM curriculum**
    - Retention of core knowledge (? Progress Test)
    - Application of integration of knowledge for clinical problem solving (? SCT)
    - Improved clinical skills (?OSCEs/clinical grades?)
    - NAVLE scores

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Questions or Comments