



Université
de Liège



WS 3 –Friday 18th Sept - 16-17.30h

Innovative tools to teach pregnancy and parturition in the horse **- *Innovation in Veterinary Education* -**

Christian Hanzen (ULg)

Jan Govaere (Ugent)



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Innovation in Veterinary Education

- How is veterinary medicine taught in Europe ? – a survey

Christian Hanzen

- How to teach (clinical skills in) Veterinary Medicine ?

Jan Govaere

- What to expect / where to invest ?

Jan Govaere



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Innovation in Veterinary Education

How is veterinary medicine taught in Europe ? – a survey
Christian Hanzen

Some preliminary questions ?

- Are you convinced that the amount of knowledge has increased ?
- We are teaching but are you sure that the students are learning ?
- Do you believe that what we are teaching is in line with the expectations of the society ?
 - 60 % of human diseases come from animals
 - farmers are facing important economical problems
 - Some diseases have disappeared and others are emerging
- Do you think that our students are the same that 30 years ago ?
- Are you still using the same tools to teach than before ?

Preliminary background (FVE Survey published in april 2015)

- 24 participating countries
- 243.000 veterinarians (44 % under 40 years)
- 13.000 have completed the questionnaire
- 157 millions companion animals
- 342 millions cattle, sheep goat and pigs

What are we doing ?

- 60 % clinical practice (predominantly small animals)
- 19 % : public services
- 6 % education and research
- 4 % industry and private research
- 10 % others areas as veterinarian

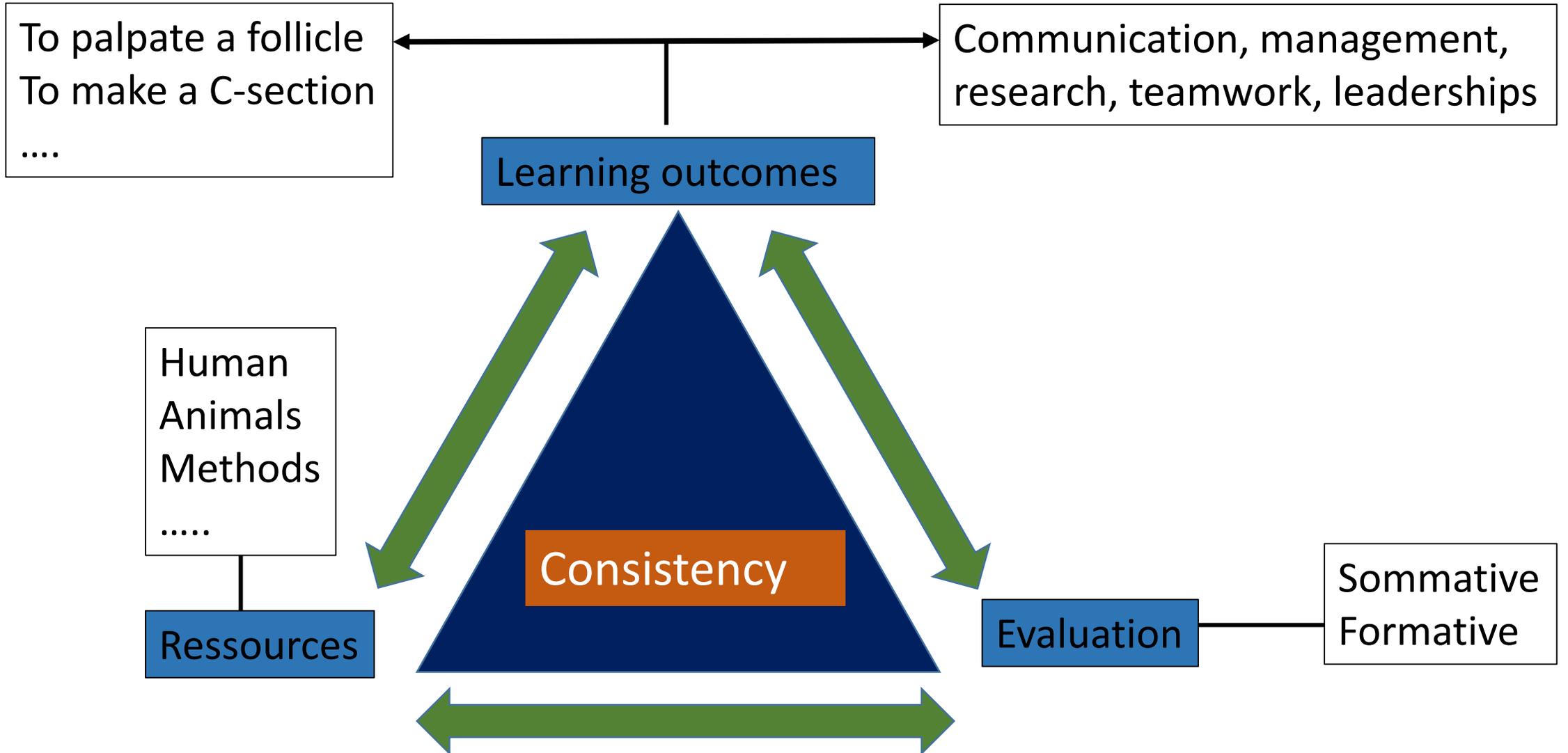
Preliminary background (FVE Survey published in april 2015)

- Veterinary unemployment (3 %) or **underemployment** (23 %) is a problem in some countries
- They are too many graduated veterinarians and **not enough in new fields** (monitoring animal welfare, exotic animals, disease control ...)
- Day one competencies will become more important as the profession will become **more specialised in the future**
- Most of practices have less than 5 veterinarians but there is a trend towards increasing corporisation and the creation of **larger practice groups**
- Females are paid **28 % less** on average than their male colleagues
- 26 % of females work **part-time** vs 12 % of males
- We observed a significant shift away from practice earnings based on **drug sales**

Why to have initiated such survey in Theriogenology ?

- To initiate a thought on the curriculum in the field of animal reproduction...
- ...and more precisely by a first step
- To identify european human resources in theriogenology : who'who
 - To share experiences and multimedia resources for learning
 - To compare evaluation methods
- To collect information on
 - Who : student population , numbers and method of selection
 - What and how : contents and time devoted to theriogenology
 - Resources : used to develop the knowledge et skill of the students
 - With whom : human resources
 - Evaluation : methods

Brief recall to understand the context of any teaching activity (3 aspects)





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Innovation in Veterinary Education

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- What to expect / where to invest ?

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Our survey : general data



Invitation sent (July) by e-mail to 82 veterinary faculties (out of 97 members of AEEEEV)

Excel file to fill name and adress

Answers to the question on line (one / faculty)

12 analysed

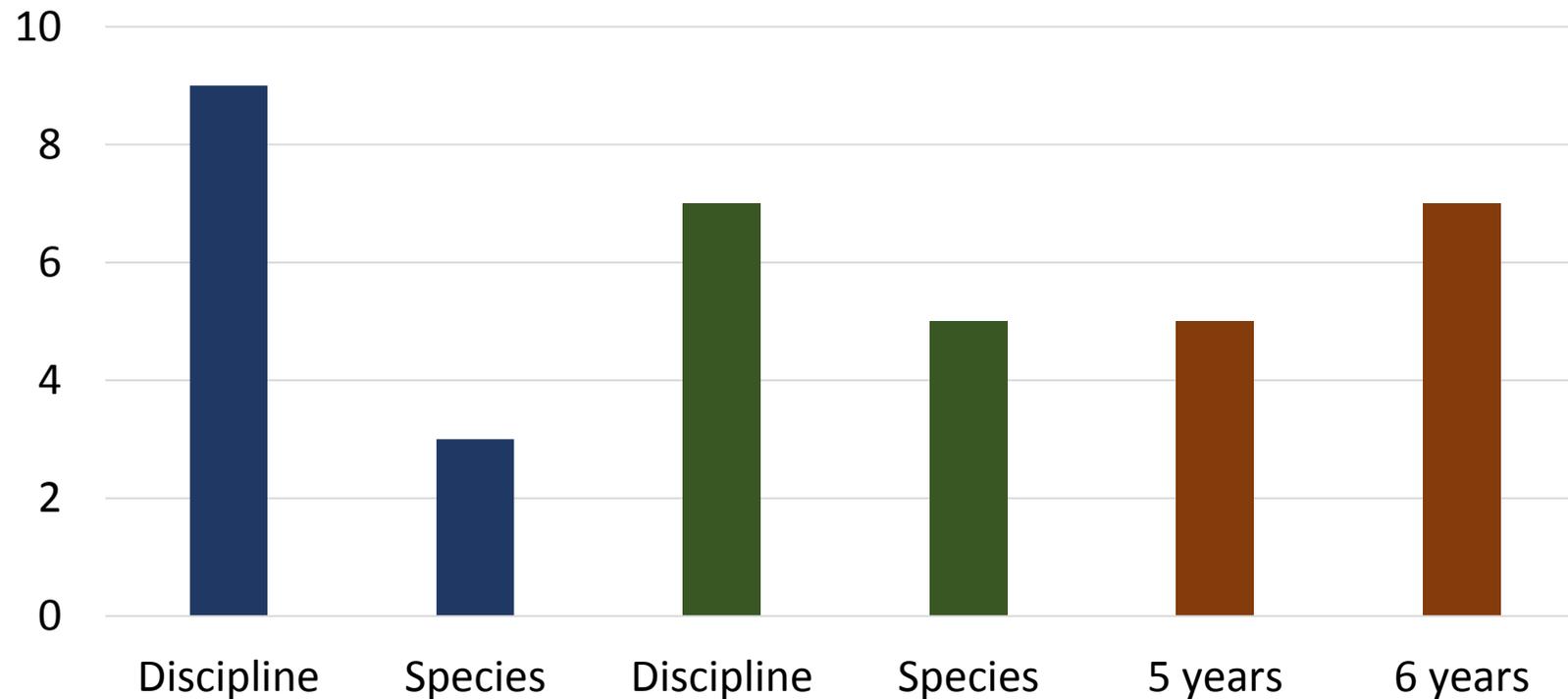
Albania	Tirana	Norway	Oslo
Austria	Wien	Poland	Lublin
Belgium	Gent	Poland	Olsztyn
Belgium	Liège	Poland	Warsaw
Bosnia/Herzegovina	Sarajevo	Poland	Wroclaw
Bulgaria	Sofia	Portugal	Coimbra
Bulgaria	Trakia	Portugal	Evora
Croatia	Zagreb	Portugal	Lisbon
Czech Republic	Brno	Portugal	Lisbon Lusofona
Denmark	Copenhagen	Portugal	Porto
Estonia	Tartu	Portugal	Vila Real
Finland	Helsinki	Romania	<u>Cluj Napoca</u>
France	Nantes	Romania	<u>Iasi</u>
France	Alfort	Romania	<u>Timisoara</u>
France	Lyon	Romania	Bucarest
France	Toulouse	Serbia	<u>Beograd</u>
Germany	Berlin	Slovakia	Kosice
Germany	Giessen	Slovenia	Ljubljana
Germany	Hannover	Spain	Barcelona
Germany	Leipzig	Spain	Caceres
Germany	München	Spain	Cordoba
Greece	Karditsa	Spain	Extra madura
Greece	Thessaloniki	Spain	Las Palmas
Hungary	Budapest	Spain	Leon
Ireland	Dublin	Spain	Lugo
Israel	Jerusalem	Spain	Madrid Alfonso
Italy	Bari	Spain	Madrid Complutense
Italy	Bologna	Spain	Murcia
Italy	Camerino	Spain	Valencia
Italy	Messina	Spain	Zaragosa
Italy	Milano	Sweden	Stockholm
Italy	Napoli	Switzerland	Bern
Italy	Padova	Switzerland	Zurich
Italy	Parma	Turkey	Afyon
Italy	Perugia	Turkey	Ankara
Italy	Pisa	Turkey	Aydin
Italy	Sassari	Turkey	Burdur
Italy	Teramo	Turkey	Bursa
Jordan	Amman	Turkey	Elazig
Latvia	Latvia	Turkey	Erzurum
Lithuania	Kaunas	Turkey	Istambul
Macedonia	Skopje	Turkey	Kafkas
Nederland	Utrecht	Turkey	Kayseri
		Turkey	Konya
		Turkey	Urfa
		Turkey	Yil
		United Kingdom	Bristol
		United Kingdom	Cambridge
		United Kingdom	Edinburgh
		United Kingdom	Glasgow
		United Kingdom	Liverpool
		United Kingdom	London
		United Kingdom	Nottingham

Our survey : general data (12 faculties)

Organization of the faculty

Organization of the learning activities

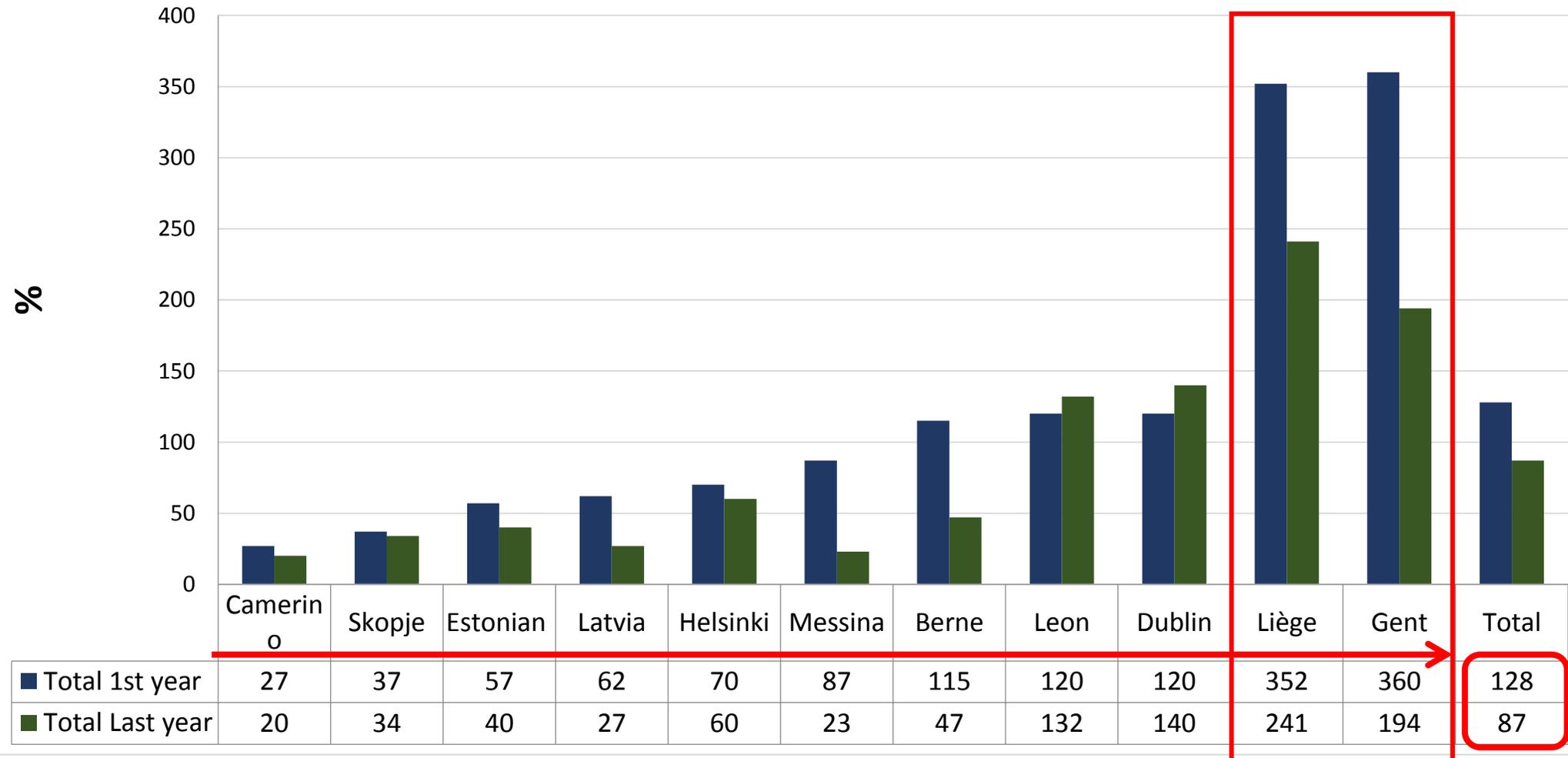
Number of years



WHO ?

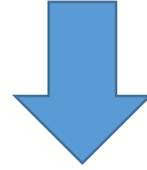
- Huge differences between faculty : plethoric situation in Belgium
- On average 35 students qualified per year

Comparison of students number in first and last year

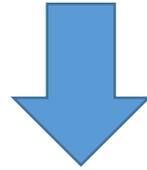


WHO ?

Process of admission of the students in 17 faculties



In 16 out of 17, there is a process to select the students



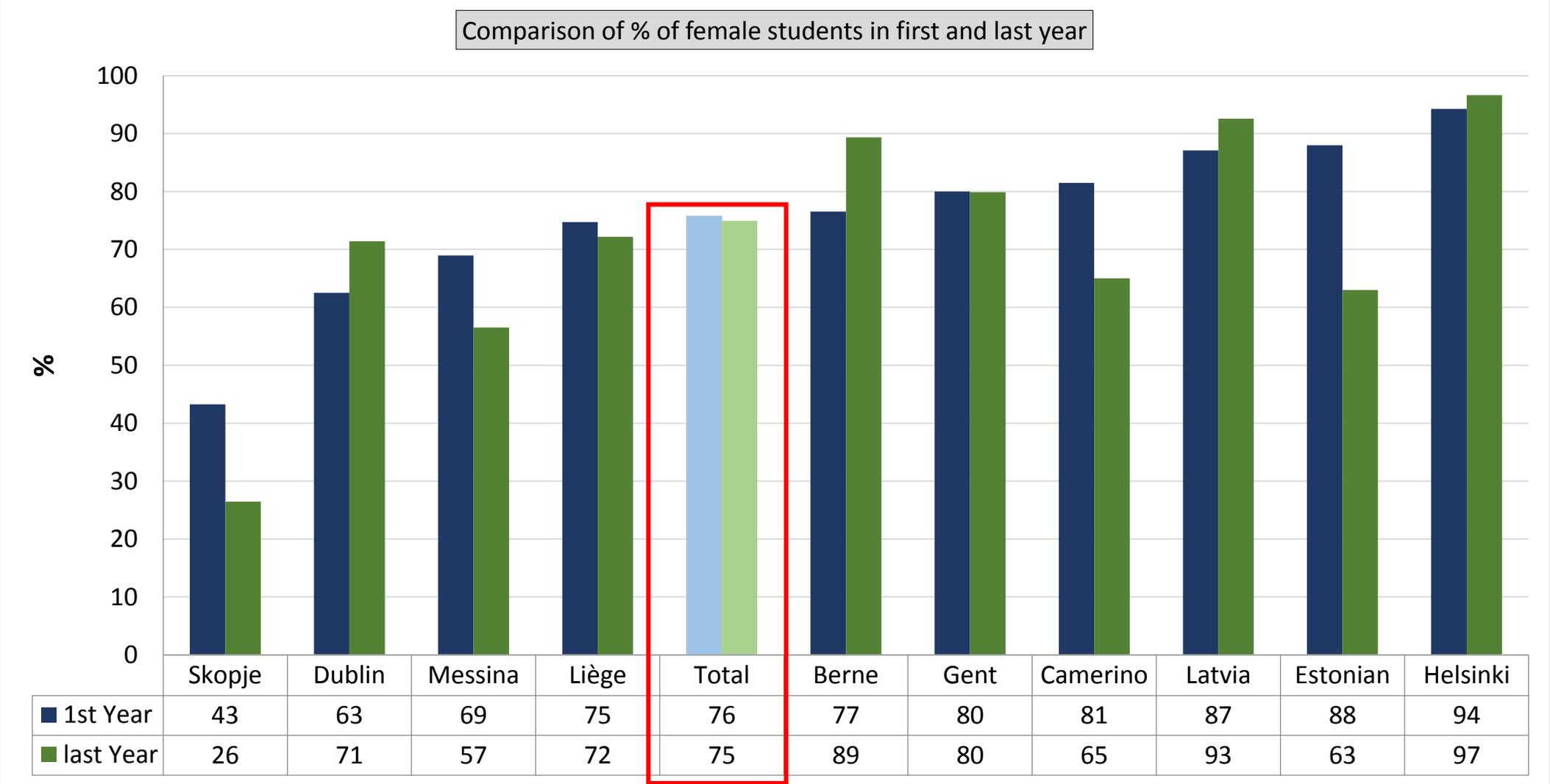
- Lottery (in Liège) to select the French students
- Exam in 6 cases
- Interview in 1 case
- Scores of secondary school in 7 cases

Question : Is it necessary to improve the selection of the veterinary students before the studies

1. Not at all
2. Yes because the financial means of the faculties are decreasing
3. Yes to increase the quality of learning
4. Yes because under employment is increasing

WHO ?

- Three students out of four are women
- Differences between faculties



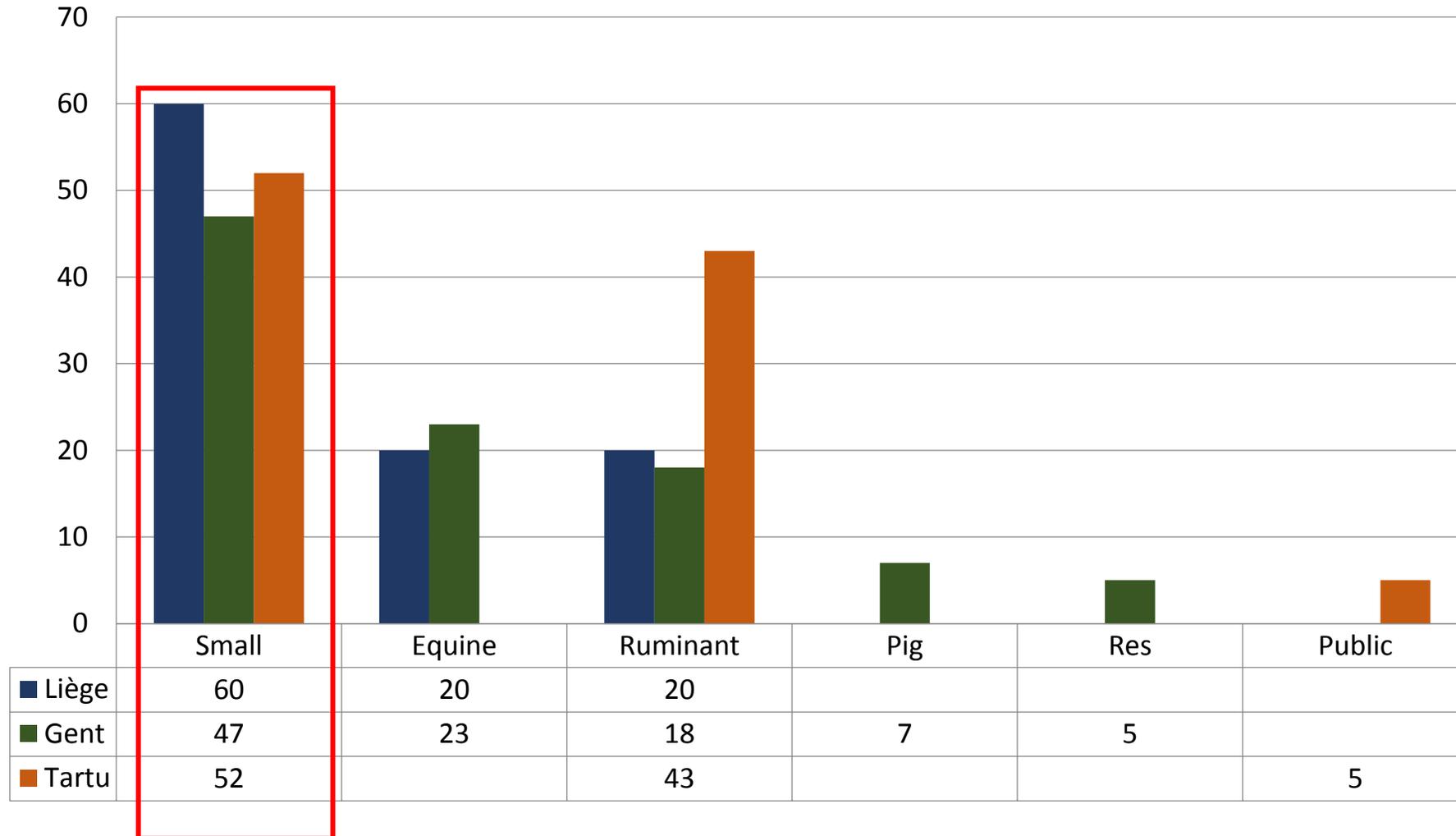
Question : The high percentage of female students is a chance for the profession

1. YES
2. NOT AT ALL

WHO TO WHAT ?

Most wanted: practice in small animals

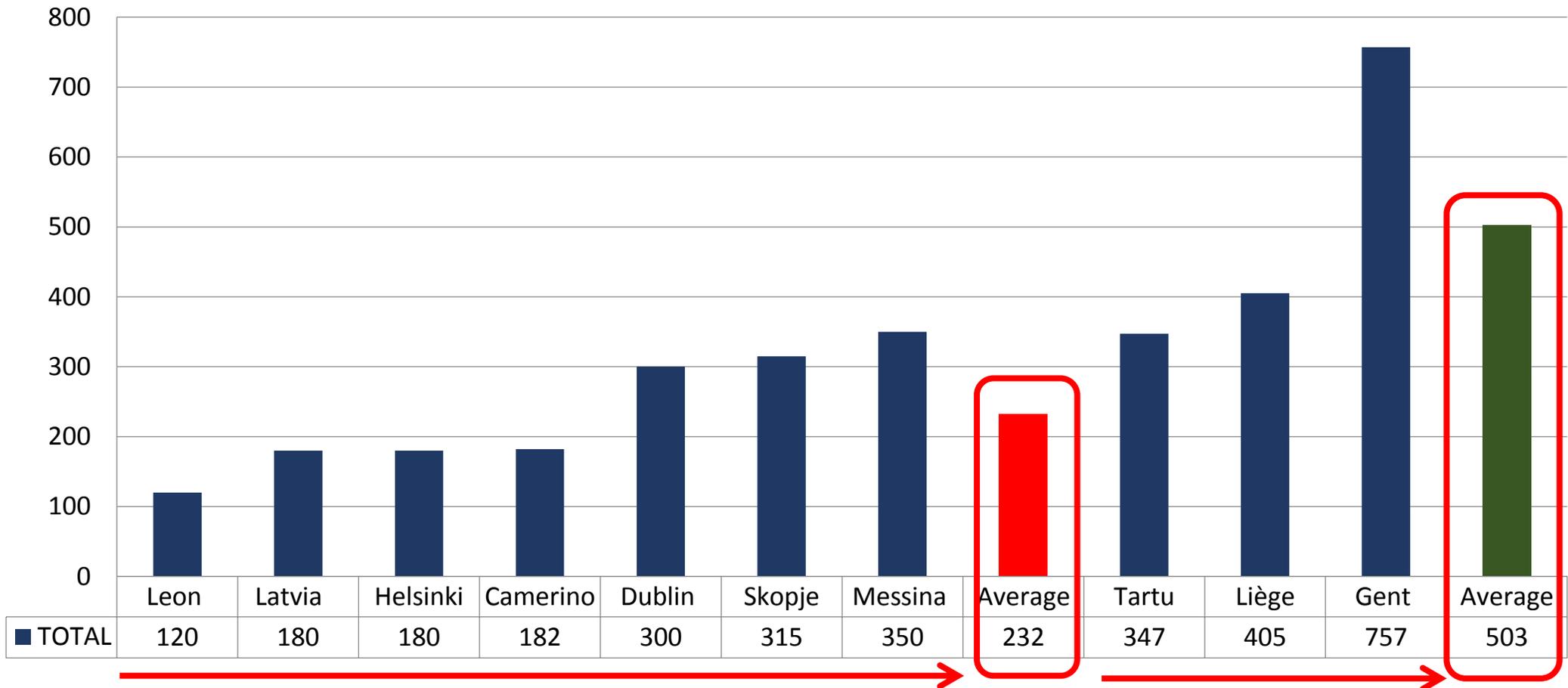
% of students by option in Gent, Liège and Tartu



WHAT AND HOW ?

Huge differences between faculties in total number of hours spent by the student in theriogenology (average 232 vs 503 h)

Comparison of total number of hours in Theriogenology according to differentiation or not during the cursus



Question : The theriology contents needs to be integrated with contents of internal medicine, surgery and medical imaging for a given species

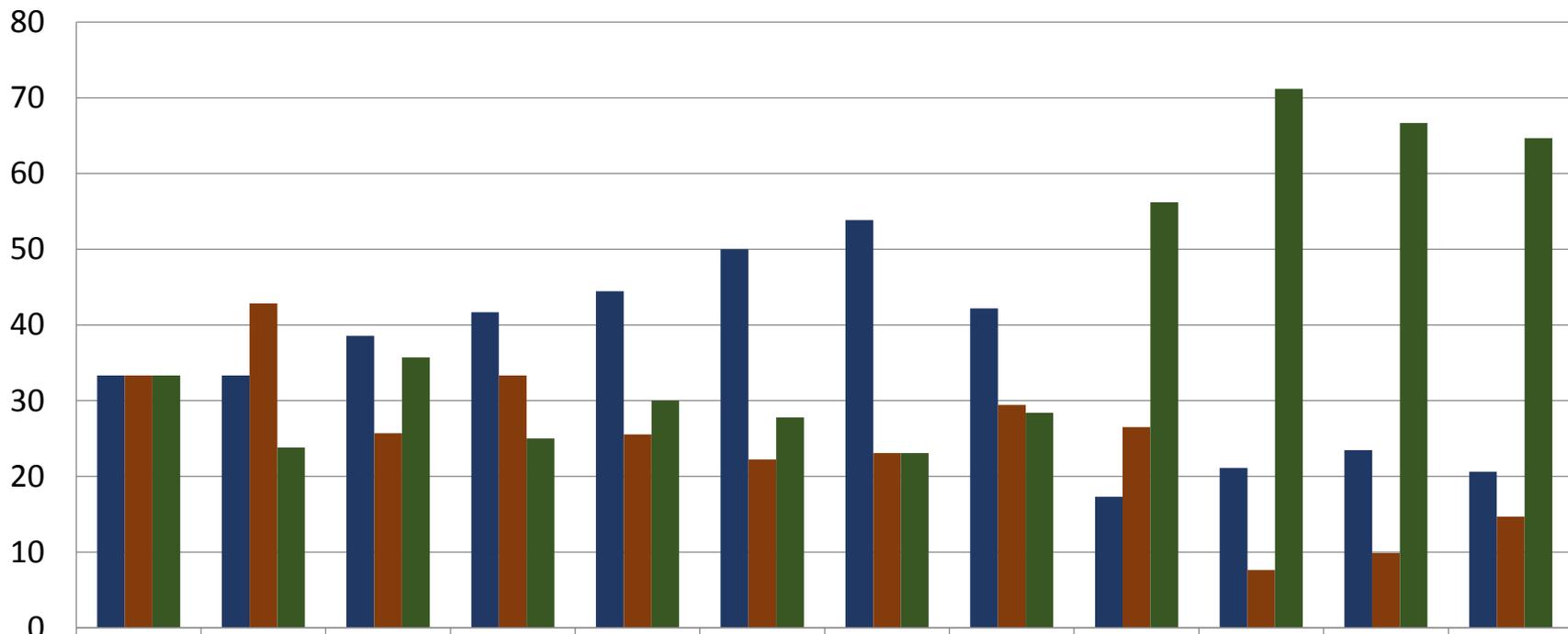
1. I AGREE

2. I DISAGREE

WHAT AND HOW ?

Learning by listening or by doing ?

Comparison (%) of theoretical, practical and clinical hours according to the two kinds of faculty (differentiation or not)

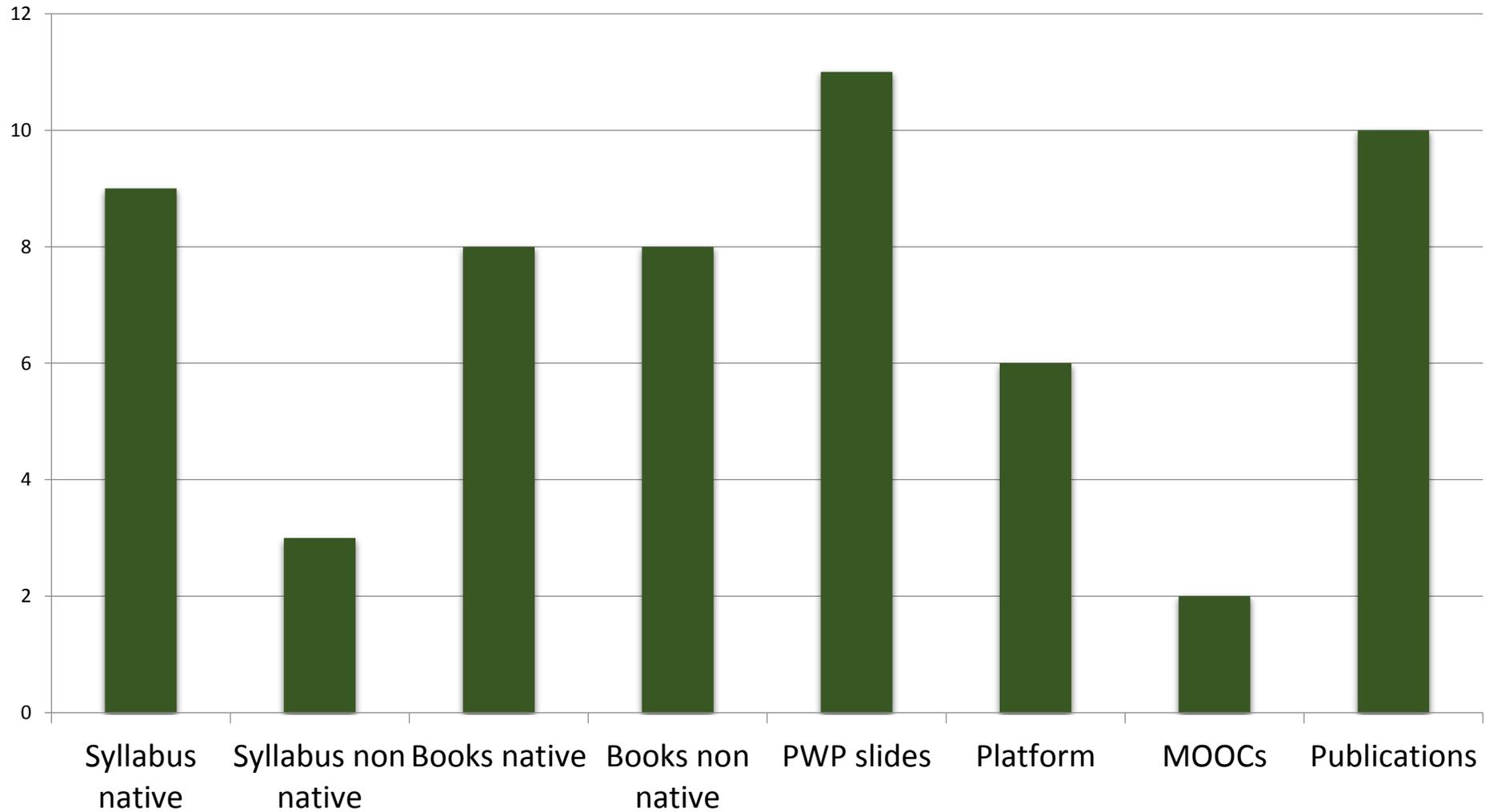


	Dublin (300 h)	Skopje (315 h)	Messina (350h)	Leon (120 h)	Latvia (180 h)	Helsinki (180 h)	Camerino (182 h)	Average	Tartu (347 h)	Gent (757 h)	Liège (405 h)	Average
■ Theory	33	33	39	42	44	50	54	42	17	21	23	21
■ Practice	33	43	26	33	26	22	23	29	27	8	10	15
■ Clinics	33	24	36	25	30	28	23	28	56	71	67	65

← Quite more Theory

→ Quite more clinics

RESOURCES (11 faculties)



Question : As a teacher, I am interested to to build a MOOC
with others colleagues
(MOOC : Massive Open Online Course)

1. YES
2. NOT AT ALL
3. I am not concerned

RESOURCES

- 5 vs 6 cases on average per student (but n of students is different)

Comparison of number of individual cases according to the number of final year students in the faculties with or without differentiation

	N last year student	Small	Horse	Ruminants	Pigs	Total	Ratio
Camerino	20	250	55	10	10	325	16
Messina	23	364	171	179	143	857	37
Latvia	27	85	15	20	4	124	5
Skopje	34	80	10	260	15	365	11
Berne	47	0	150	50	2	202	4
Helsinki	60	50	100	10	0	160	3
Leon	132	350	50	15	1	416	3
Dublin	140	25	25	20	0	70	1
Average	60	151	72	71	22	315	5
Tartu	40	25	25	50	5	105	3
Ghent	194	100	1000	250	0	1350	7
Liège	241	450	150	570	0	1170	5
Average	158	192	392	290	2	875	6

RESOURCES

- Herd medicine is developing

Comparison of herds visit, examined animals according to the number of final year students

	N last year student	N Herd visit	N exams	Total cows	Pig Herd visit	N exams	Total pigs
Camerino	20	7	100	2000	3	50	150
Messina	23	12	20	2000	3	3	200
Latvia	27	12	30	400	4	30	200
Skopje	34	15	45	550	5	25	300
Berne	47	1300	8	1400	27	0	0
Helsinki	60	20	20	600	5	20	200
Leon	132	5	20	2000	2	10	500
Dublin	140	40	40	1000	10	10	0
Average	60	60	60	60	60	60	60
Tartu	40	50	35	150	2	15	100
Ghent	194	400	30	2500	40	30	10000
Liège	241	90	30	900	0	0	0
Average	158	180	32	1183	14	15	3367

RESOURCES

Contextualisation of theriogenology outside the faculty

Comparison of compulsory stages (if any) according to the year of study

		1st	2nd	3rd	4th	5th	6th	Total
Latvia	No							0
Helsinki	No							0
Berne	Yes				4			4
Ghent	Yes			3		1		4
Messina	Yes				1	5		6
Leon	Yes				3	3		6
Camerino	Yes		2			18		20
Skopje	Yes	4	4	4	4	4	4	24
Dublin	Yes	6	6	8	8	8		36
Liège	Yes		2				16	18
Tartu	Yes	1	4	4		11	15	35
Average		4	4	5	4	7	12	14

Stages distributed during the cursus

Relatively large time for contextual education

WITH WHOM

- Relatively few internship and residency
- Compare with the number of students in final year
- on average one academic or scientific for 10 students

Comparison of human resources

	Acad	Scient	PhD	Intern	Resid	Nurses	Techn	Total	N stud last year
Camerino	1	0	0	0	0	0	0	1	20
Messina	4	2	2	0	0	1	1	10	23
Latvia	2,6	4	2	0	0	1	1	10,6	27
Skopje	2	6	4	0	0	1	1	14	34
Tartu	4,5	3	5	0	0	2	2	16,5	40
Berne	5							5	47
Helsinki	5	6	8	0	2	0,5	0,5	22	60
Leon	4	2	5	0	0	0	1	12	132
Dublin	3	4	6	0	1	1	2	17	140
Ghent	6	17	26	3	1	0	12	65	194
Liège	2	4	1	0	0	0	1	8	241
Average	3,6	4,8	5,9	0,3	0,4	0,7	2,2	16,5	87,0

Question :

In my faculty, teaching activities are more recognized (for an academic career) than research activities

1. YES

2. NOT AT ALL

EVALUATION

- More often written than oral exams
- What importance of formative tests

Methods of theoretical and clinical evaluations (1st choice)

	Theoretical	Clinical
Camerino	oral exam	oral (Mini Clinical Exam)
Latvia	oral exam	oral (OSCE)
Messina	written exam (MCQ)	continuous
Liège	written exam (MCQ)	oral (Mini Clinical Exam)
Tartu	written exam (MCQ)	oral (OSCE)
Leon	written exam (OQ, SLEQ)	continuous
Dublin	written exam (OQ, SLEQ)	continuous
Helsinki	written exam (OQ, SLEQ)	oral (OSCE)
Skopje	written exam (OQ, SLEQ)	continuous
Ghent	written exam (OQ, SLEQ)	oral Mini Clinical Exam)

OQ : Open questions

MCQ : Multiple choice questions

SLEQ : Short/Long Essay Questions

OSCE : Objective Structured Clinical Examination

EVALUATION

- How to define success of a curriculum ?

Success rate according to the year of studies

	1st	2nd	3rd	4th	5th	6th
Messina	80	80	70	70	80	
Latvia				30	60	100
Leon				75	75	
Dublin	90	95	93	98	98	
Helsinki	98	97	95	93	90	70
Skopje	48	33	24	20	16	15
Liège	52	67	79	80	94	100
Tartu	80	85	90	90	95	100

AND FINALLY

Main problem encountered with teaching reproduction

What about
Belgian beers ?

OK but they have
Guinness ...

	Main problem (1st choice)
Leon	high numbers of students
Liège	high numbers of students
Ghent	high numbers of students
Tartu	high numbers of students
Dublin	no problem at all
Messina	not enough live material (experimental animals)
Latvia	not enough live material (experimental animals)
Helsinki	not enough live material (experimental animals)
Skopje	not enough live material (experimental animals)
Camerino	not enough time to teach all content

High numbers of student
Not enough time to teach all content
Not enough live material (experimental animals)
Not enough clinical cases
No problem at all



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Innovation in Veterinary Education

- How is veterinary medicine taught in Europe ? – a survey

Christian Hanzen

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- What to expect / where to invest ?

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How to teach (clinical skills in) Veterinary Medicine ?

Q3: ultrasound in the mare: the 'best' way to learn ?

- setting -

A1: clinical rotation

A2: theory first / clinical rotation

A3: theory

A4: whatever + questioning during the exam

How to teach (clinical skills in) Veterinary Medicine ?

rectal examination - US
scanning - how many repetitions





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How to teach (clinical skills in) Veterinary Medicine ?

Q2: rectal examination - US scanning - how many repetitions ?
- in an academic educational program –

A1: 10

A2: 10-30

A3: >30...

How to teach (clinical skills in) Veterinary Medicine ?

rectal examination - US
scanning - how many repetitions

- In cattle
 - 100 palpations
 - Cx, horns : size and consistency
 - Pregnancy 60d
 - Perioestrus period
 - Postpartum
 - -> ovarian palpation - and early pregnancy diagnosis
- In horses ?



*Lopez and Rocha 2006
Bossart et al 2008.*

Nagel et al. 2015.



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How to teach (clinical skills in) Veterinary Medicine ?

HOW ? : Ugent- evaluation of education – gynaecol. Ultrasound of the mare

- = mini-CEX

Mini clinical exam

- = MCQ

Multiple choice questions

- SE (self assessment)
- Evaluation of Education
- PT (practical knowledge testing)



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How to teach (clinical skills in) Veterinary Medicine ?

- SE (self assessment)

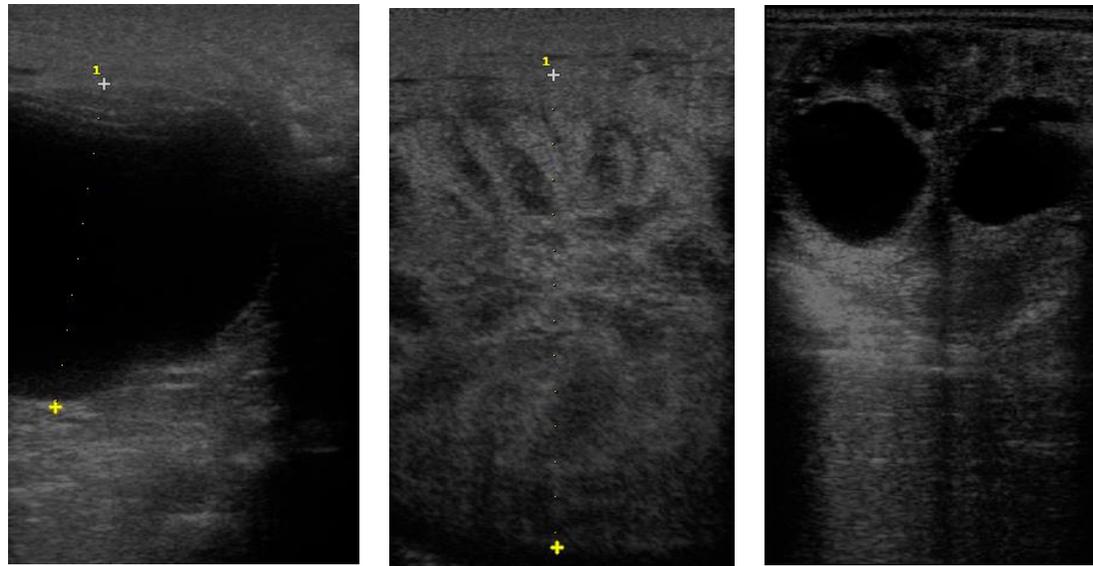
“confident and ready to give practical veterinary guidance in a stud farm concerning equine reproduction”

- Evaluation of Education

*“how do you appreciate theoret., clinical and practical education”,
“advises-remarks “*

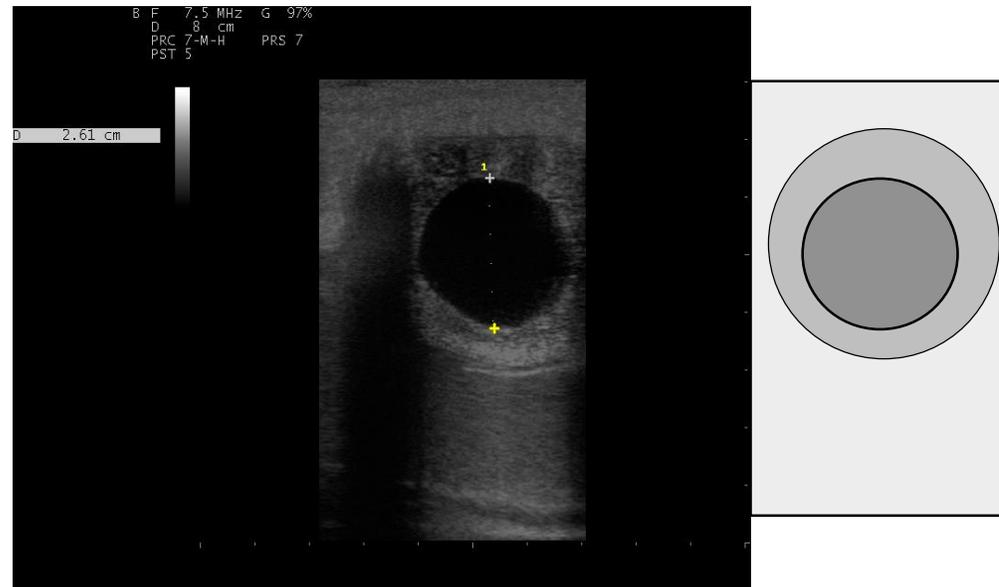
- PT (practical knowledge testing)

PT (practical knowledge testing) - I



1. *Stage of cycle*
2. *Uterus echogenity grading*
3. *When should you use hCG*
4. *When to cover the mare*

PT (practical knowledge testing) - III



Ultrasonographic image of uterus with an embryonic vesicle

- 1. where will the embryonic disc appear?*
- 2. define : “encroachment”*
- 3. can you indicate on the diagram the future course of the umbilical cord*

How to teach (clinical skills in) Veterinary Medicine ?

SE : 63%

PT: 43.2% (16.5%)

TT: 65.5% (69%)

- expectancy
- teaching quality
- variability in case load
 - ↑
 - ≠
- Feedback
- Continuing education
- IQ >< EQ

How to teach (clinical skills in) Veterinary Medicine ?

rectal examination - US scanning - how many repetitions

- scores on practical test – weakly correlated with numbers of Rectal Palp performed ($r=0,281$)

Govaere et al. 2016

- Voluntary commitment does not imperatively lead to skills acquisition
-> For most students, the driving force is “**what will be on the test**” rather than understanding concepts

Senger et al. 2012

- The No of rectal exams performed had no influence on results in the theoretical test



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How to teach (clinical skills in) Veterinary Medicine ?

Q5: How to teach complex topics – your personal opinion

A1: stimulate students to make their own scheduals, diagrams etc

A2: provide tekst, pict, movies etc

A3: complete animated material “ready to swallow”



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How to teach (clinical skills in) Veterinary Medicine ?

Q: How can animations help you when teaching ?

- Example -

A1: it's fun to look at

A2: gives in an easy way insight in the structure – evolution

A3: its the 21th cent. drawing/schedual

A4: enables students to rehearsal the subject again without guidance



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How to teach (clinical skills in) Veterinary Medicine ?

Q: How can animations help you when teaching ?

A1: faster acquisition of knowledge / insights for the audience

A2: better knowledge retention in long term

A3: both A1 and A2

A4: no significant differences with a good old ex cathedra teaching method; knowledge acquisition and retention

A5: gives more confusion due to access. detail









3,18



3,94 10,8 45,58

4,76 13,92 61,31 5,83

3



4,19 12,67 58,09

5,04 14,89 56,43 4,79

2,81



3,93 15,30 62,01

5,07 18,21 60,40 4,95

3,54

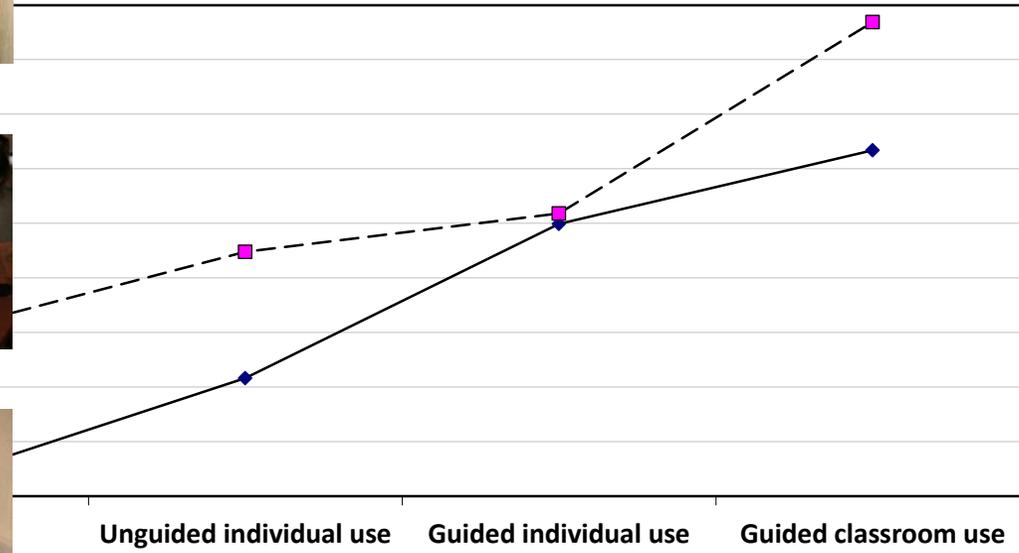


4,32 16,78 63,46

6,01 14,29 64,34 4,89



25,0
17,5
12,5



—◆— Time 1
-■- Time 2



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How to teach (clinical skills in) Veterinary Medicine ? Animations : any benefit ?

multimedia presentation

-> effective to teach complex concepts in a shorter time

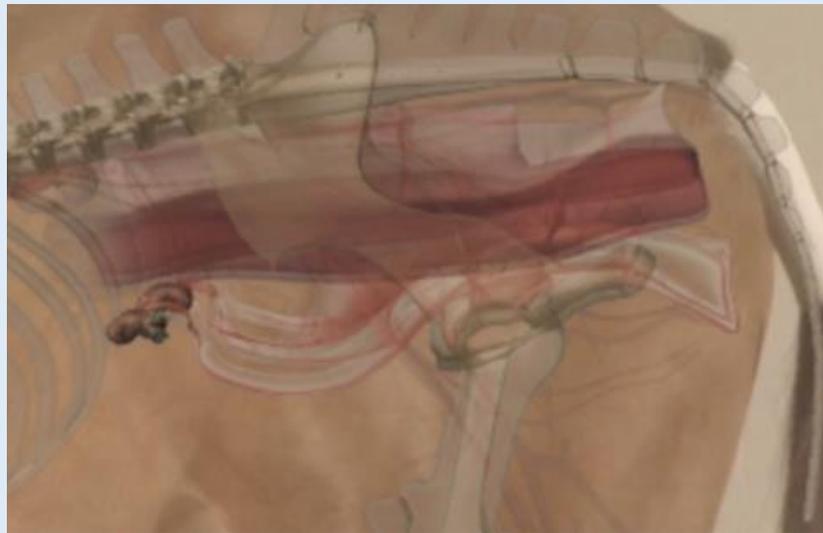
-> better knowledge retention

-> audience even without specific training can understand complex concepts

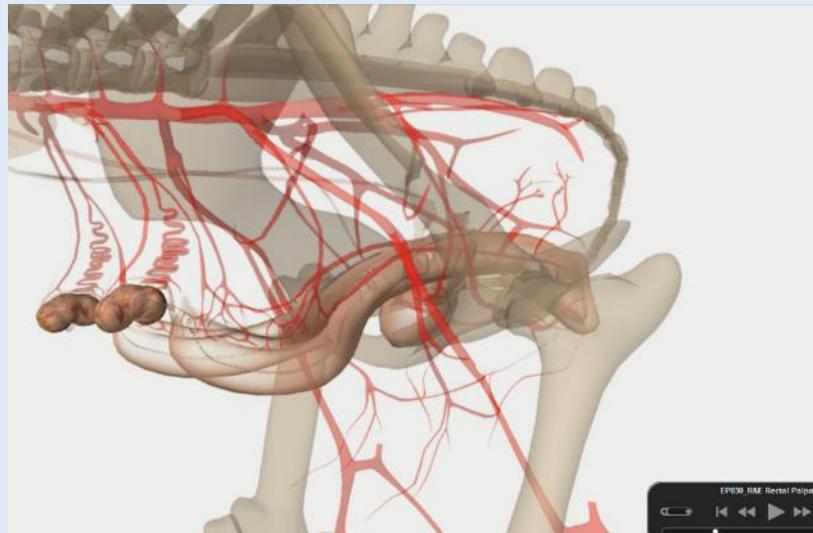
Govaere et al. 2012
Senger et al. 2012

How to teach (clinical skills in) Veterinary Medicine ?

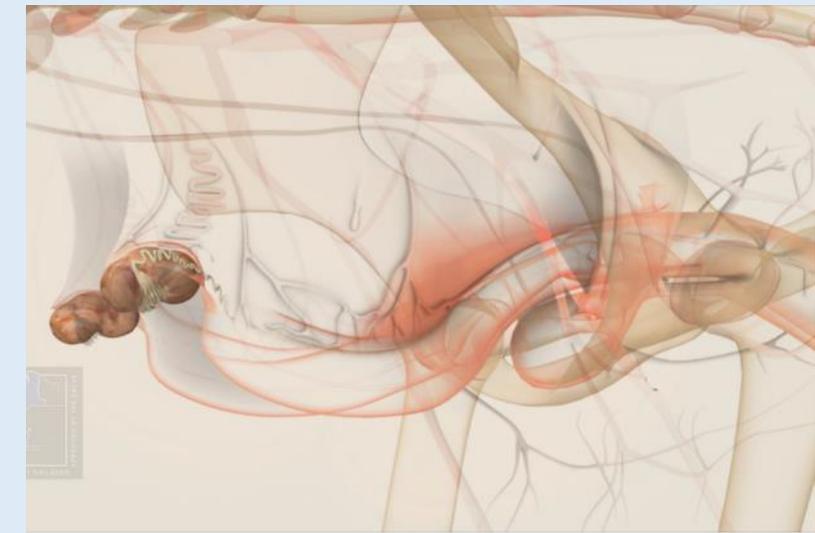
Q5b: when teaching how to rectal examine the mare, which of the pict would you prefer ?



A1



A2

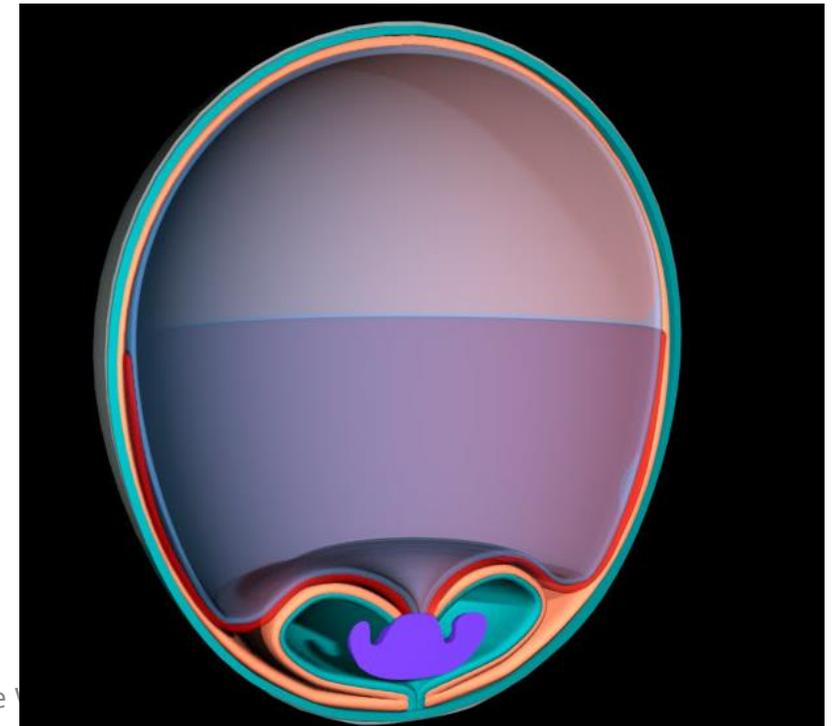


A3



How to teach (clinical skills in) Veterinary Medicine ?

Q5b: when teaching how to rectal examine the mare, which of the pict would you prefer ?





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How to teach (clinical skills in) Veterinary Medicine ?

Q5c: How to teach complex evolutions and topographic anatomic changes in (equine) reproduction

Message in illustration :

A1: simple – one message at the time

A2: physiological as complete/with all complexities

A3: provide only clinical relevant items/details



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How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations

Describe time-related changes

Senger et al. 2012

+ powerful learning intervention

Betrancourt 2005

- Learning can be depressed with excessive verbiage or images

Mayer et al. 1996-

How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Learning

-> auditory + optic (dual coding)

Paivio 1986

Clacrk and Paivio 1991

-> limited processing capacity & easily overloaded

Baddeley 1986, 1999

-> learning : when engaged in processing information

Witrock 1989; Mayer 2005



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How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations

- goal: facilitating learning
- topic
- priority (detail of knowledge)
- what visual aids ?
- script

Senger 2012

How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations , structure

- PRE training
- MODALITY (auditory and optical) –
 - > scientific textbooks: ‘only’ optic sensory input
 - > overload / confusion
 - > students minimize pre-class reading

Polloc et al 2002, Mayer et al. 2002

Tindall-Ford et al. 1997

Senger 2012

How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations , structure

- PRE training
- MODALITY (auditory and optical) –

Polloc et al 2002, Mayer et al. 2002

Tindall-Ford et al. 1997



Senger 2012

How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations , structure

- PRE training
- MODALITY
- COHERENCE
 - “unessential detail”
 - ~ level of (pre)knowledge
 - ~ level of required detail – specific audience

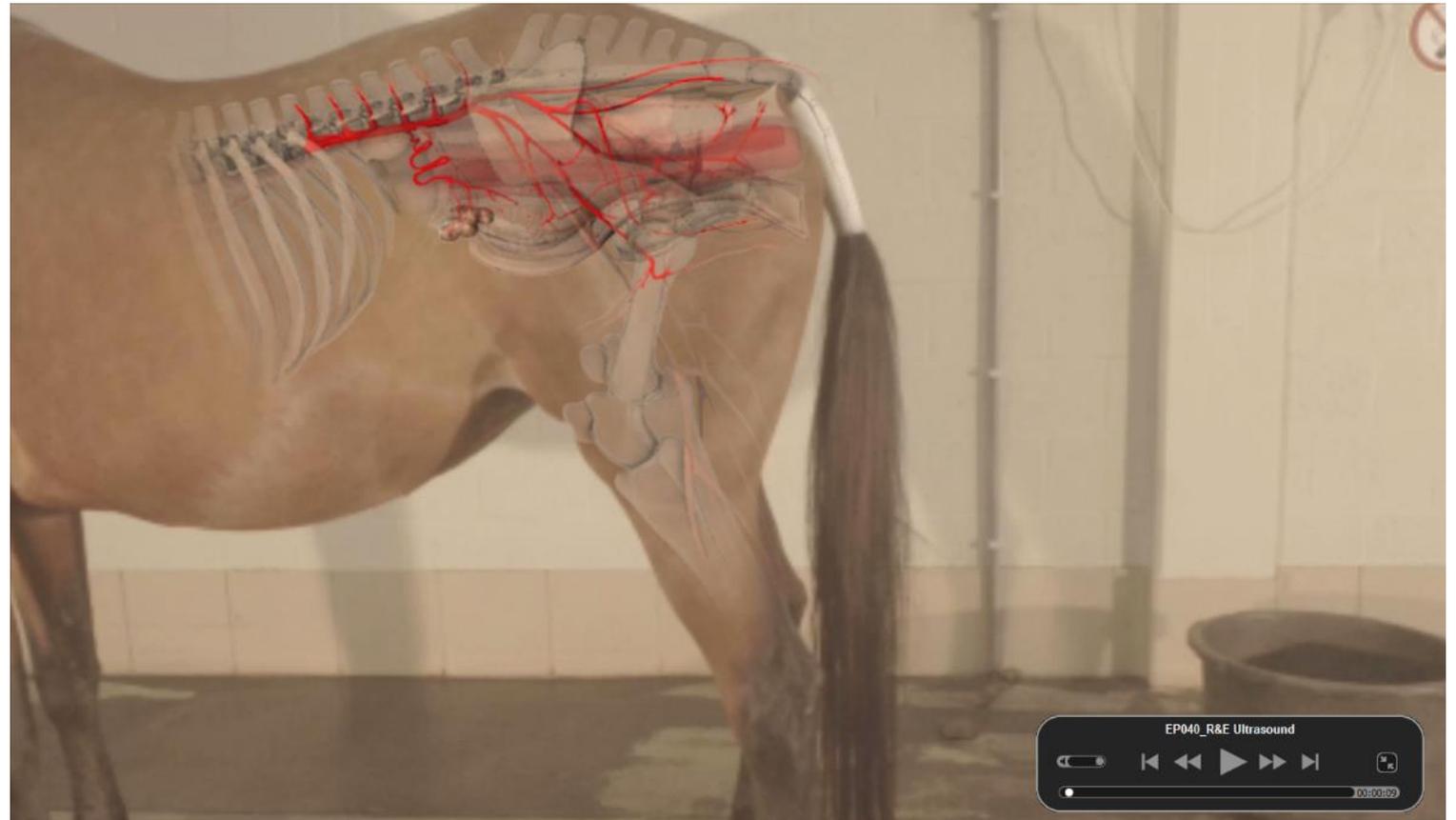
Senger 2012

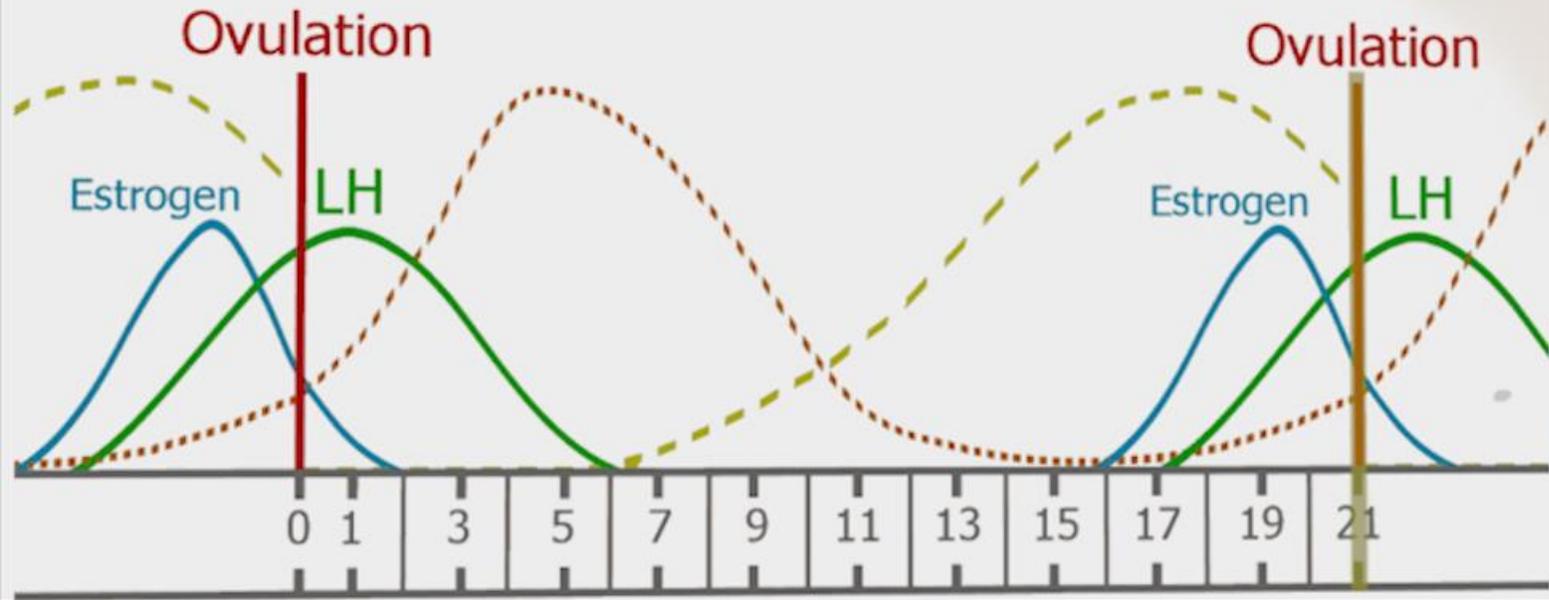
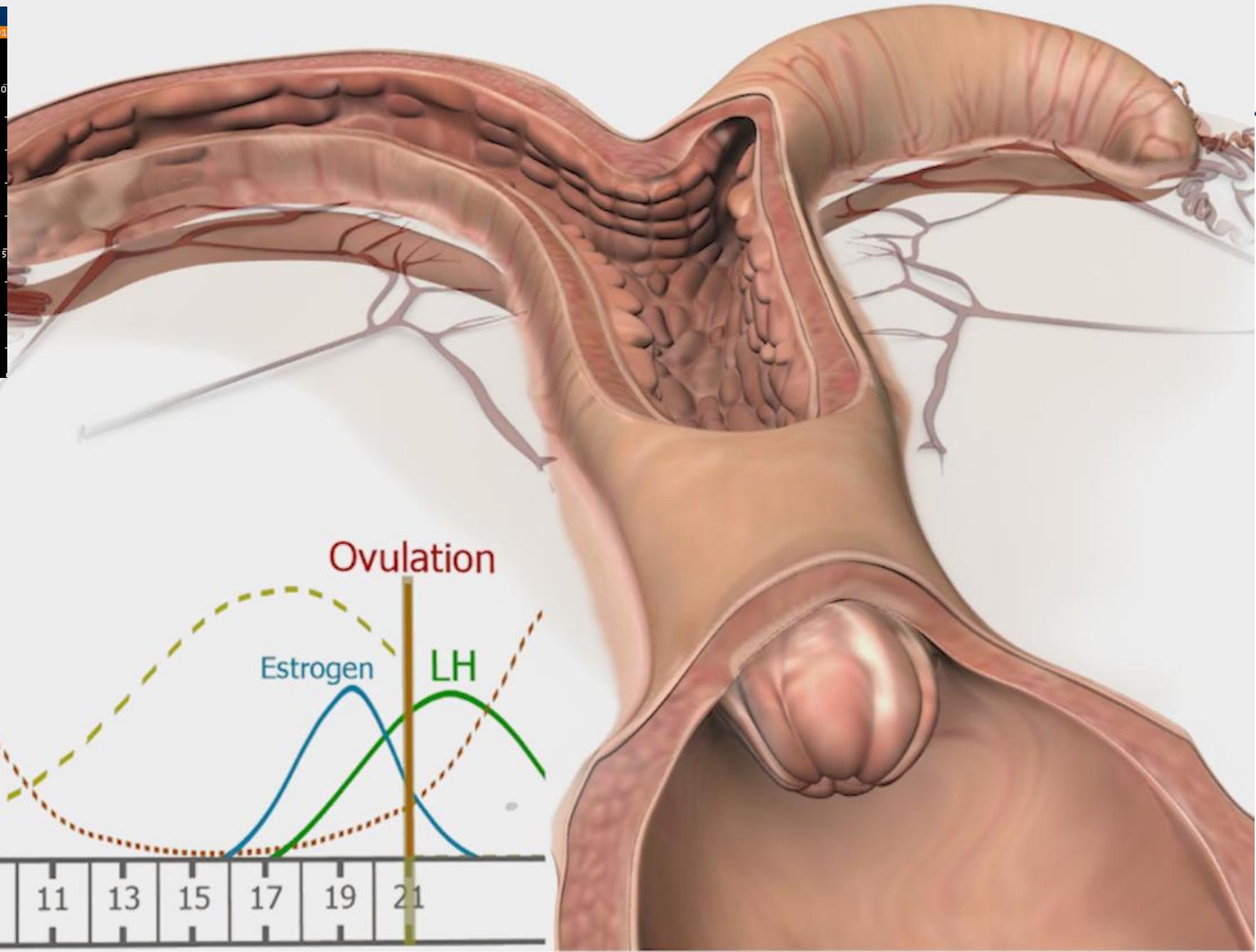
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Animations , structure

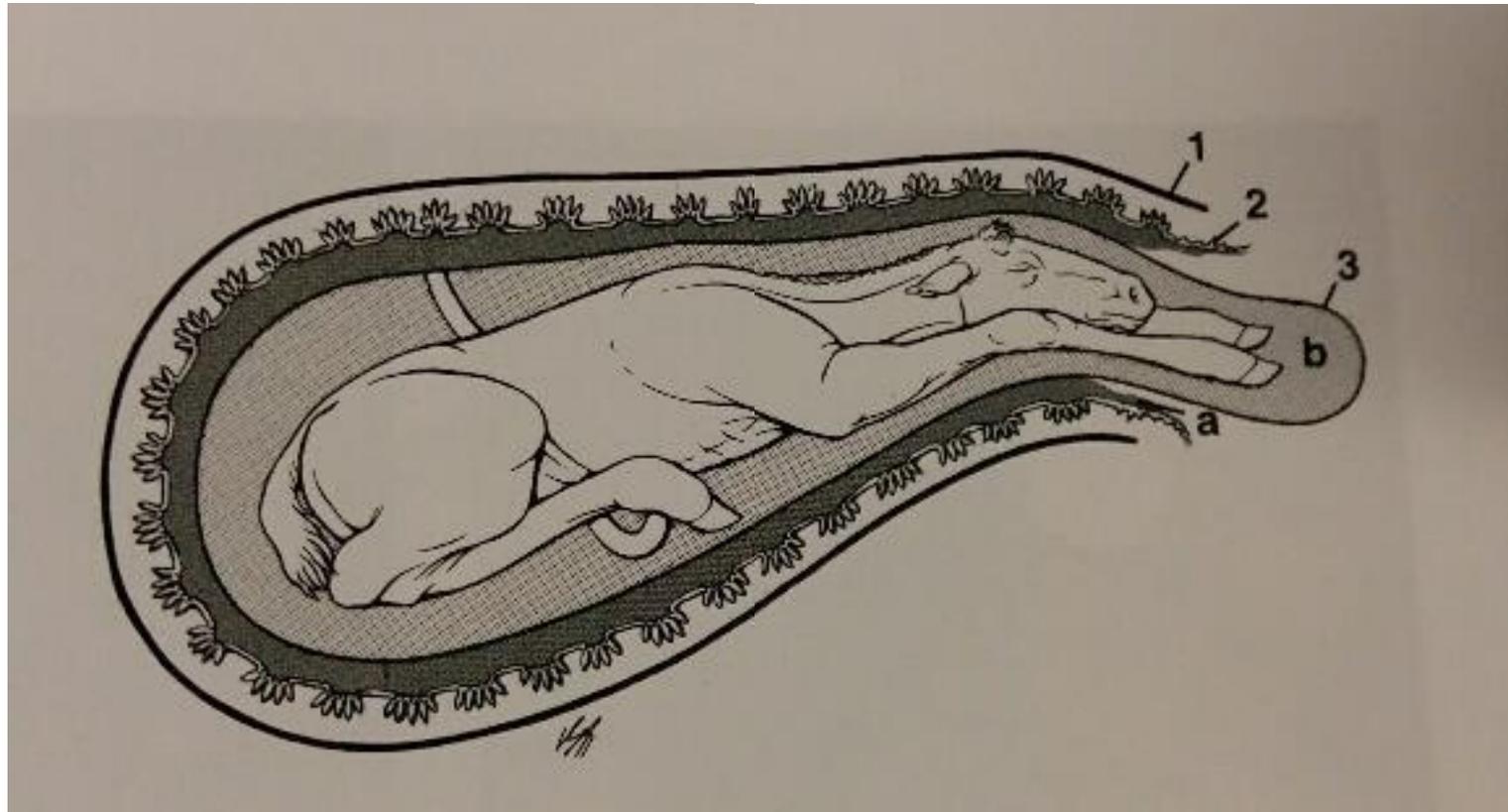
- PRE training
- MODALITY
- COHERENCE

-





How to teach (clinical skills in) Veterinary Medicine ?





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How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations , structure

- PRE training
- MODALITY
- COHERENCE
- PERSONALIZED

- “ now that we have described the structure we will have to know how....”

*Kartal 2010; Mayer et al. 2004;
Moreno and Mayer 2000, 2004*



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How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations , structure

- PRE training
- MODALITY
- COHERENCE
- PERSONALIZED
- ANIMATION

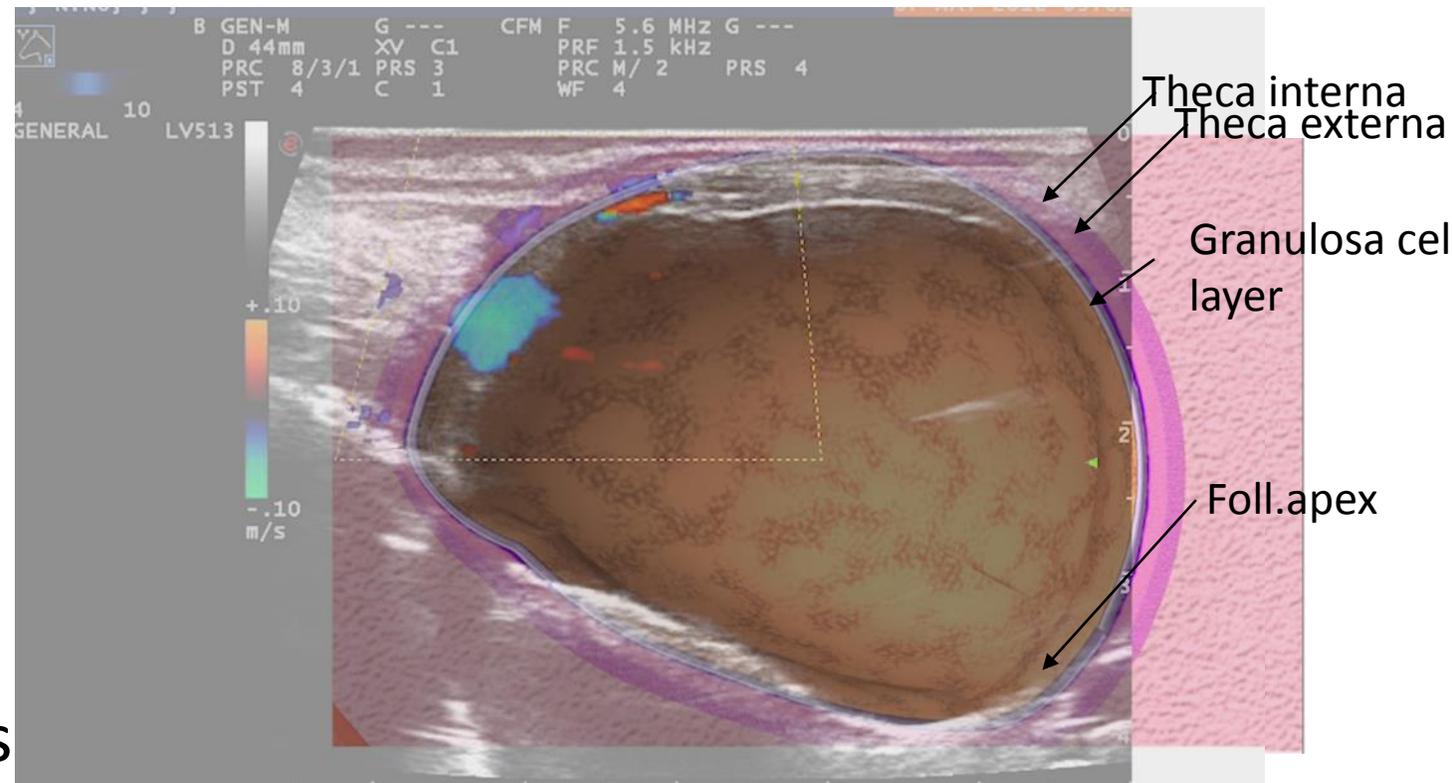
– dynamic processes easily understood when animated

*Gonzales 1996; Betrancourt 2005;
Trevistan et al. 2010*

How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

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- dynamic proces



*Gonzales 1996; Betrancourt 2005;
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How to teach (clinical skills in) Veterinary Medicine ? How can animations help you when teaching

Animations , structure

- PRE training
- MODALITY
- COHERENCE
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– dynamic processes easily understood when animated

- exploration of [animation](#)

Gonzales 1996; Betrancourt 2005;

Trevistan et al. 2010



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Innovation in Veterinary Education

- How is veterinary medicine taught in Europe ? – a survey

Christian Hanzen

- How to teach (clinical skills in) Veterinary Medicine ?

Jan Govaere

- What to expect / where to invest ?

Jan Govaere

What to aspect / where to invest ?

- Invention of printing almost 600y ago
read – listen- re-reading & review notes – testing

Senger et al. 2012

- Since 60y: overhead, doc camera, PPT

- ? Mobile technology ?

-> reduce time of delivery and improves understanding

Trevisan et al. 2010



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What to aspect / where to invest ?

- “digital immigrants”
- “erosion of (classroom) authority”

Senger et al. 2012
Trevisan et al. 2010

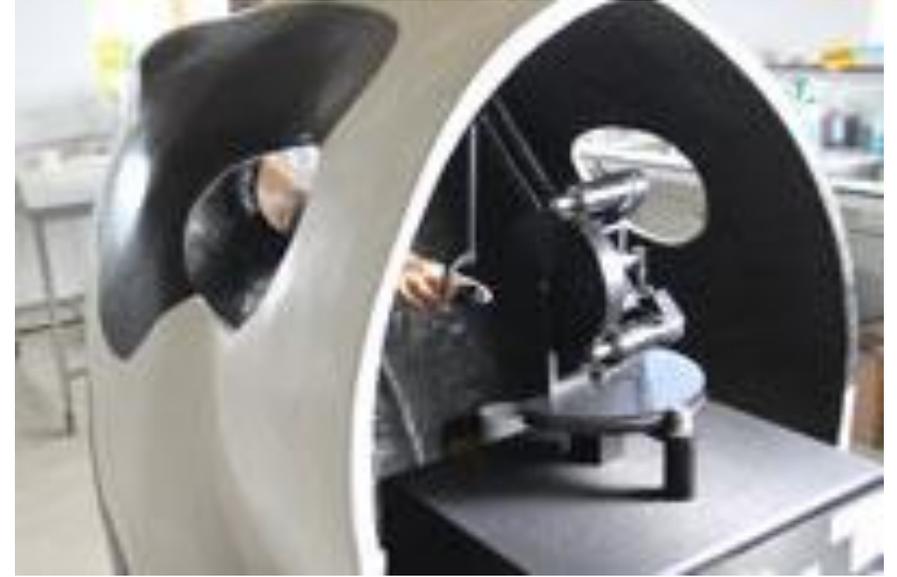
What to aspect / where to invest ?



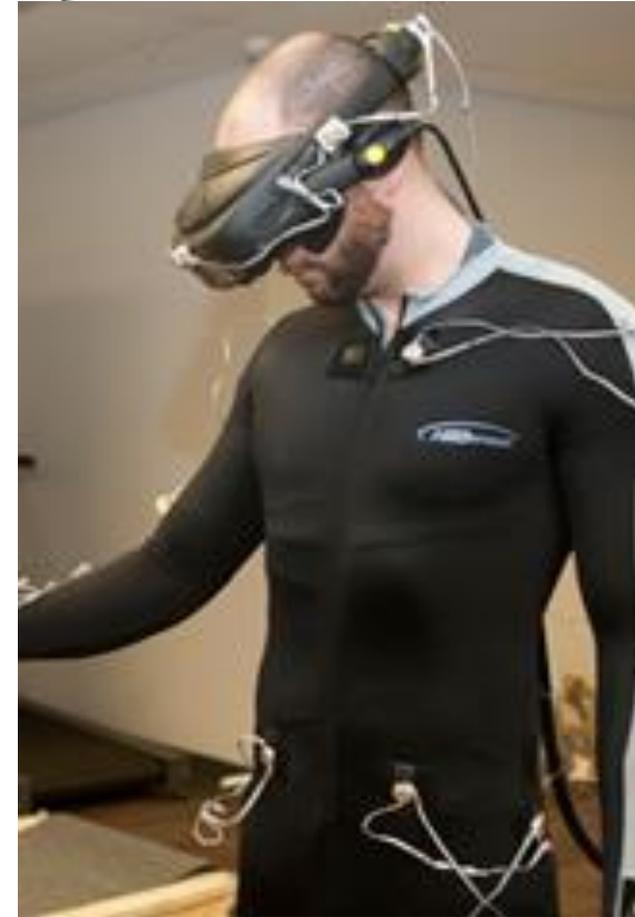
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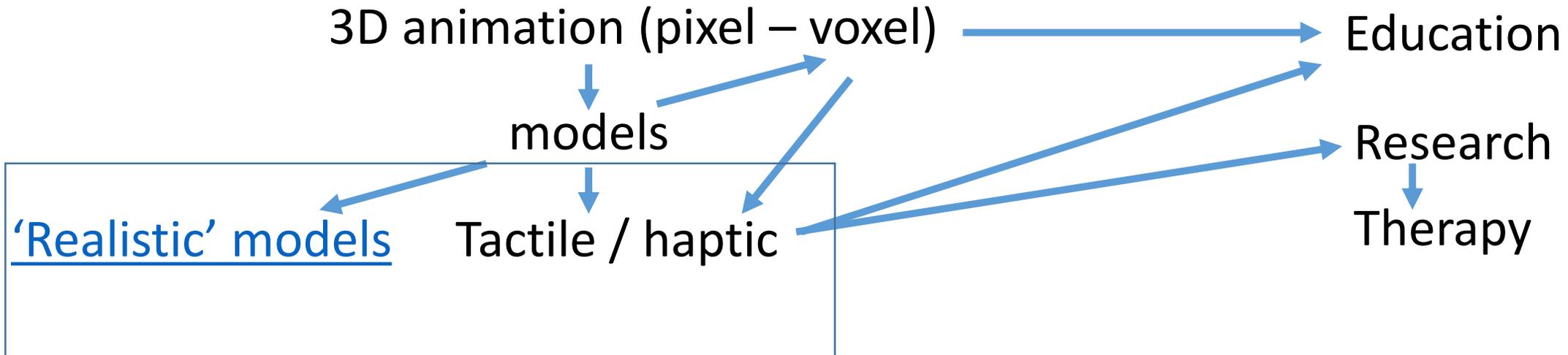
Nisky et al. 2012



Baillie S 2009



What to aspect / where to invest ?





2027 (Sept 2025) Farid, Bangladesh - Shantosh & Dr. Sovadee Web

Innovation in Veterinary Education