2019

I International Congress of Education in Animal Sciences (ICEAS)

Évora

Portugal

7-6-2019

I International Congress of Education in Animal Sciences (ICEAS)
June 7, 2019 - Évora

Scientific Committee

- A.B. Rodrígues Moratinos (University of Extremadura, Spain)
- A.G. Mateos (University of Extremadura, Spain)
- A. Pereira (University of Évora, Portugal)
- A. Tvarijonaviciute (University of Murcia, Spain)
- C. Lavrador (University of Évora, Portugal)
- D. Escribano (Autonomous University of Barcelona, Spain)
- E. Lamy (University of Évora, Portugal)
- E. Leclerc Duarte (University of Évora, Portugal)
- F. Capela e Silva (University of Évora, Portugal)
- J. Aladrovic (University of Zagreb, Croatia)
- R. Payan Carreira (University of Évora, Portugal)
- S. Félix Lucena (University of Évora, Portugal)

Organizing Committee

- A. Tvarijonaviciute (University of Murcia, Spain)
- C. Lavrador (University of Évora, Portugal)
- D. Escribano (Autonomous University of Barcelona, Spain)
- E. Lamy (University of Évora, Portugal)
- F. Capela e Silva (University of Évora, Portugal)
- M. João Lança (University of Évora, Portugal)
- S. Félix Lucena (University of Évora, Portugal)

ISBN: 978-84-09-12019-2

Index

INVITED PRESENTATIONS....5
INTERACTIVE QUESTIONNAIRES IN CLASS.... 6
TEACHING IN THE OPERATING ROOM....7
RESOURCES IN THE PRACTICAL TEACHING OF VETERINARY ANATOMY OF UNIVERSITY OF MURCIA, SPAIN.... 8
THE USE OF FISHES IN SCIENTIFIC RESEARCH AND PRACTICAL COURSES.... 10
ICT INFUSION IN VETERINARY EDUCATION – A PARADIGM SHIFT IN TEACHING AND LEARNING OR A NEW NORMAL?.... 11
THE RVCS CLINICAL SKILLS CENTRE, ITS USE, ESTABLISHMENT AND INTEGRATION INTO THE CURRICULUM....13
TEACHING ANIMAL WELFARE.... 14
OPENING THE DOOR OF NON-HUMAN ANIMALS TO OUR MORAL ARENA.... 16
ORAL PRESENTATIONS.... 18
LEARNING TO COMMUNICATE WITH PET OWNERS IN THE DIGITAL AGE.... 19
TURNING STUDENTS' SMARTPHONES INTO A TOOL FOR AN INTERACTIVE LEARNING ENVIRON*MENTI*....20
PERCEPTIONS OF STUDENTS IN A VETERINARY MASTER DEGREE ABOUT THE USEFULNESS OF THE LINK BETWEEN RESEARCH AND TEACHING.... 21
TEACHING OUTSIDE THE CLASSROOM – FIELD AND LABORATORY EXPERIENCES IN LARGE CARNIVORES RESEARCH....23
THE ENFORCEMENT OF THE 3RS PRINCIPLE IN THE PRACTICAL TRAINING OF VETERINARY STUDENTS AT FMV-U LISBOA....24
AN INNOVATIVE PEDAGOGICAL APPROACH, BASED ON THE DELPHI METHOD, TO SUPPORT ANIMAL WELFARE TEACHING....26
ANICARE - EDUCATE ANIMAL WELFARE AS A FARMING OPPORTUNITY....28
ÉVORA CHEESE PRODUCTION SYSTEMS: TEACHING AND LEARNING WITH A UNIVERSITY-ENTERPRISE COOPERATION....30
Poster presentations....31
INCREASING INTEREST IN THE ACADEMIC RESEARCH CAREER PATH IN BSC IN BIOLOGY STUDENTS....32
BUILDING COMPETENCES THROUGH THE HIGHER EDUCATION PROGRAMMES....33
THE USE OF PORTFOLIOS TO ENHANCE SELF-REGULATED LEARNING SKILLS....35
SYLLABUS AND FLIPPED RESOURCES- NEW PEDAGOGICAL APPROACHES....36

THE ROLE OF ABROAD INTERNSHIPS IN LEARNING FROM DIFFERENCES: ROQUEFORT VS ÉVORA CHEESE PRODUCTION SYSTEMS 37

EXPERIENCE IN LECTURING OF PHYSIOLOGY OF DOMESTIC ANIMALS IN ENGLISH LANGUAGE IN CROATIA 39

A MASTER'S DEGREE RESEARCH: PROTEOMIC APPROACH ON EWE'S CHEESE 40

IMPLEMENTING PROBLEM-BASED LEARNING IN ONE MODULE OF A MASTER COURSE IN MOLECULAR BIOLOGY AND BIOMEDICINE: SATISFACTION OF STUDENTS 42

TEACHING AND LEARNING BEYOND-THE-BOOKS: DAIRY FARM EXPERIENCES 43

TEACHING OUTSIDE THE CLASSROOM IN SANITARY INSPECTION CURRICULUM - AN OVERALL VIEW OF THE FISH AND FISHERY CONTENTS 45

THE EVOLUTION OF THE PRACTICAL EDUCATION OF THE ANATOMY UNITS OF THE VETERINARY MEDICINE IN THE UNIVERSITY OF ÉVORA: USE OF CORPSES: PRIVILEGE OR TRIVIALITY? 46

VOLUNTEER STUDENTS' KNOWLEDGE ABOUT THE IMPORTANCE OF PREANALYTICAL PHASE IN LABORATORY DIAGNOSTICS 47

INCREASE IN STUDENT SATISFACTION AND COMPREHENSION AFTER IMPLEMENTATION OF HANDS-ON PRACTICALS IN A REPRODUCTION AND DEVELOPMENT MODULE 48

QUESTIONNAIRE SURVEY OF ONE WORLD, ONE HEALTH CONCEPT AMONG VETERINARY STUDENTS 49

USE OF BIOMARKERS IN SALIVA TO EVALUATE STRESS IN VETERINARY STUDENTS: A GENERAL OVERVIEW 50

VIRTUAL MICROSCOPY AS A TEACHING TOOL IN HISTOLOGY TRAINING 52

EMPLOYMENT OF INTERACTIVE WHITEBOARD AND REAL-TIME PROJECTION OF SURGERIES IN THE THEORETICAL-PRACTICAL TEACHING OF MASTER STUDENTS IN THE SMALL ANIMAL CLINIC OF THE UNIVERSITY OF MURCIA 54

FROM IDEA TO PRACTICE: A LOW-TECH MODEL TO TRAIN SMALL ANIMALS OBSTETRIC SKILLS 55

THE RISE OF NON-CONVENTIONAL THERAPIES IN VETERINARY PRACTICE - A FAILURE IN THE EDUCATION OF VETERINARY STUDENTS? 56

ACADEMIC RESEARCH ON CATTLE'S ACCLIMATISATION PROCESS 58

INVITED PRESENTATIONS

INTERACTIVE QUESTIONNAIRES IN CLASS

S. Martínez-Subiela
University of Murcia, Murcia, Spain

In the current context of university education, framed within the European Higher Education Area, it has opted for a profound methodological renovation. One of the multiple changes made, is the new orientation given to the training process —from teacher-oriented to student-centered learning. Thus, students become the main axis in the teaching-learning process. Special attention has been dedicated to the tools that facilitate collaborative learning in educational institutions, in which students teach and learn from each other and develop interdependence. In this context, active methodologies have been introduced during the last years that, in many cases, come with powerful tools, such as the case of Information and Communication Technologies that quantitatively and qualitatively facilitate collaborative work. In this way, several educational institutions starting some years ago to use “clickers”: electronic devices used to get the feedback or answers of students in real time. They require purchasing devices and sometimes software to record student responses. However, currently some webpages and mobile apps exist which can facilitate teacher’s question-giving and answers-receiving tasks. These web pages or apps, are smart student response systems that unlike "clickers", does not require the purchase of any special system to register student responses since only an Internet connection and a mobile device (telephone, tablet or laptop) are necessary.

This presentation will be focused on “socrative” which is an online response system that allows teachers to carry out questionnaires and other activities and monitor student responses and their progress in real time. Therefore, this presentation will provide an overview of the potential application of this system as a complementary tool in classroom in order to engage active student participation in class and improve collaborative learning.

Keywords: Socrative, Mobile APPS, Quizzes, Portable devices

TEACHING IN THE OPERATING ROOM

R. Dąbrowski
University of Life Science, Lublin, Poland

"Pedagogy should at its best be about what teachers do that not only help students to learn but actively strengthens their capacity to learn." David Hargreaves, Learning for Life, 2004, p. 27.

The studies of veterinary medicine at the Faculty of Veterinary Medicine in Lublin last 11 semesters. From the beginning, students are required to undergo compulsory practical trainings in different departments, including surgery, reproduction, internal diseases and epizootiology. In general, students do not actively participate in practical classes for to their fear to fail in front other students, lack of knowledge, and lack of self-confidence, which is frustrating for teachers who believe that they have failed. In order to improve students` involvement in clinical reproduction classes, we use (1) multimedia and technology (like cameras, films, projectors, sound recording equipment, animation/PowerPoint™, films) to teach students surgical procedures surgery and clinical examinations of pets, and (2) phantoms of animals and suture skills trainer pads to show them all the suturing methods. Most importantly, however, it to allow them participating in different procedures, e.g. suturing the skin, giving injections and/or formulating the anesthetic plans for further surgeries, which obviously should increase their engagement and preparation skills, motivate them and find a passion for learning. On the other hand, this implies a number of tasks that have to be performed by teachers. Teachers should constantly balance the quality and safety of patient care with the learner's needs to make independent decisions and gain hands-on experience, monitor the student's performance and maintain the patient's safety (!), enhance reflections during surgery, determine strengths and weaknesses of each of the students and provide immediate feedback when needed. Finally, and most importantly, it is essential to assess the student's performance and provide feedback, make them consider postoperative outcomes, decide how to improve their performance, correct weaknesses and guide the students to determine their needs and future objectives.

Keywords: Operating room; Multimedia; Students involvement; Trainnings

RESOURCES IN THE PRACTICAL TEACHING OF VETERINARY ANATOMY OF UNIVERSITY OF MURCIA, SPAIN

M.D. Ayala Florenciano
University of Murcia, Murcia, Spain

During the talk, the main benefits of each of the resources listed below that School of veterinary medicine of University of Murcia counts with for veterinary student formation, and their optimal usage conditions and timings will be discussed.

- Museum contains skeletons, bone pieces and organs of number of animal species both domestic and wild. In this space, first year students are taught osteology of domestic species: horse, carnivores, pig and ruminants.
- Dissection room, where corpses of different domestic species are used by students to acquire manual skills and study the neuromuscular and visceral systems, and topographic anatomy of domestic species. Some of these anatomical pieces are fresh, but the most of them are fixed with fixative liquid (formaldehyde mixed with other substances: phenol, etc.). Furthermore, the vessels and synovial structures are usually filled with latex.
- Plastination laboratory. Different techniques are applied in order to obtain perennial and non-toxic plastinated pieces that do not require special conservation methods and allow student a safe their handling. These techniques use polymers like silicone (silicone-10 technique). The silicone is introduced into the organ during the impregnation phase through a vacuum pump. Other techniques use resins as impregnation material (polyester or epoxy) and are mainly used to obtain anatomical sections, which range between 2-4 mm thick (P-40 technique) or 200 µm-2 mm (E-12; E-6/E-600 techniques). These sections allow the visualization of structures with high resolution, thus allowing a meticulous study of the anatomy and histology of the organs. Our department offers annual courses to teach these techniques to any interested person. All the information about these courses can be obtained on our website: https://www.um.es/web/anatvet/
- Computer program (Amira program) is used for the reconstruction of organs in 3D previously obtained images from tomography (CAT) or magnetic resonance (MR). These can later be printed by using a 3D printer.
- Books and interactive learning programs. Our group has published a number of books that include texts and images of all the anatomical material that the students usually see in the anatomical museum and the dissection room. In addition, we have developed interactive computer programs that allow the review of anatomical structures from the student's personal computer. Some of those programs are: Interactive Review of Locomotive Apparatus Practices; Interactive Review of Visceral

Systems Practices; Reproductor Apparatus of the Domestic Mammals; Anatomy of the Pig; Bird anatomy, Anatomy of Fish, etc.

- Furthermore, students have access to videos, in which teachers explain the main contents of anatomy discipline using the material of the museum and the dissection room. These videos have been highly accepted not only among students of University of Murcia, but also by already graduated veterinary professionals from our country and also by students and specialists from some European countries, including Portugal, and Latin American countries. All interactive material and videos are available on our website and are open and accessible to any interested person.

Keywords: Anatomical material; Plastination techniques; Interactive and Video programs

THE USE OF FISHES IN SCIENTIFIC RESEARCH AND PRACTICAL COURSES

P. R. Almeida
University of Évora, Évora, Portugal

Experimental studies and practical courses using live and/or intact specimens continue to play an important role in developing knowledge and better understanding of biological processes and ecosystem functioning. Fishes are by far the most diverse group of vertebrates, with more than 32 000 species, exhibiting incomparable diversity in their morphology. From hagfishes and lampreys to sharks, lungfishes and flatfishes, coelacanths and sturgeons, fishes have many unique physiological, behavioural, and ecological specializations. Fishes occupy virtually almost all aquatic environments on Earth. Understanding their biology cannot be accomplished in the absence of experimentation with live, intact animals. The first documents that use fishes as a study subject were written by Aristotle (384-322 BC), but only in the 16th-century during the European Renaissance the concept of modern ichthyology began to take form with the works of H. Salviani, P. Belon, and G. Rondelet. Latter one, in the 17th century P. Artedi, so called "father of ichthyology", contributed to Linnaeus's refinement of the principles of fish's taxonomy.

There are many reasons to study fishes, namely: (i) fishes are good indicators of environmental quality and ecological integrity; (ii) fishes provide an important source of food for humans and terrestrial animals, and also for other aquatic animals; (iii) fishes are a fundamental part of aquatic ecosystems; (iv) catching and observing fishes are very popular and economically important recreational and commercial activities for millions of people around the world; (v) the unique adaptations and physiological specializations of fish make them especially suitable for use as physiological and biomedical models; and (vi) fishes play a key role in understanding animals' evolution on our planet.

The diversity of fishes creates many opportunities for new research, but it also makes the task of developing research protocols that would apply to all species and all circumstances impossible. Researchers have to follow broad guidelines building on the most current, scientifically valid information. Government agencies often require that researchers follow codes which prescribe acceptable strategies, techniques, facilities, conditions, and post-experimental disposition of animals used in research. However, responsibility for the ethical and scientific validity of each study and the methods employed rests with the researcher who frequently is the authority on the species or systems involved in their studies.

ICT INFUSION IN VETERINARY EDUCATION – A PARADIGM SHIFT IN TEACHING AND LEARNING OR A NEW NORMAL?

R. Macharia
Royal Veterinary College, London, United Kingdom

Information and computer technologies (ICT) are creative tools that when deployed in the right learning environment are able to transform teaching and learning practice.

Most learners (millennials) will reach university with a range of different digital competencies and literacies that they have acquired at school and home. This existing expertise and knowledge endow them with the skills and expectation to use technology to enhance their learning experience. Driven and drawing from this educational advantage, many educational institutions have made a considerable investment in ICT infrastructure as well as human resource in order to set up and populate e-learning platforms to meet with the demands of existing and emerging crop of e-learners. However, it is important to note that benefits despite the initial costs of the investments accrue to both the students and the educational institutions in various ways.

The ICT competencies of the millennials, their expectations notwithstanding have been the main drivers and leverage in the infusion and adoption of a digital curriculum. Faced with the challenges of the new learner, it is a 'do or die' for the viability of learning institutions. Moreover, the emerging pedagogy premised around student-centered learning is more favored to the traditional pedagogy centered on a teacher because it allows the student to drive their own learning through active experimentation, collaboration and encourages creativity. In addition, the limitations of space and time are easily managed as students can learn whenever and wherever except for lab based or practical classes.

Challenges however abound in the infusion and adoption of a digital technology challenge by academics/faculty who have to move from their reliance on traditional teaching methods in order to apply a repertoire of new approaches to enhance their teaching and apply them in a classroom setting. In addition, there is a need to recognize that not all students have the same aptitude for e-learning, and it is important to ensure that institutions respect the diversity in digital competency.

The current trends in teaching and learning in veterinary education, driven by millennial learners are more than ever dependent on ICT, and its adoption is not only a paradigm shift in providing education but a new normal.

THE RVCS CLINICAL SKILLS CENTRE, ITS USE, ESTABLISHMENT AND INTEGRATION INTO THE CURRICULUM

N. Coombes
Royal Veterinary College, London, United Kingdom

Nichola Coombes has worked at the Royal Veterinary College (RVC) since 2004, just before the Clinical Skills Centre (CSC) opened, so she has been involved in the successes and the occasional mistakes made when setting up/establishing the first Veterinary Clinical Skills Centre in Europe. The RVCs CSC has been established for 15 years. This presentation will be concerning the following matters

- Why it was considered necessary, what is the purpose within the curriculum
- What do we teach here
- How do we teach
- How to staff it
- What are the key skills
- Exams use
- Things to think about when establishing a CSC, an 'ideal' centre.

By the end of this short presentation, you should have a clearer idea of how the CSC is used and why the facility is so successful.

TEACHING ANIMAL WELFARE

G. Stilwell
University of Lisbon, Lisbon, Portugal

Animal Welfare is a multidimensional concept deeply bonded to all branches of animal science. It is now constantly reviewed and judged by consumers, technicians, farmers, politics and society in general.

Although it probably owes its existence to society ethical concerns and not to scientists' inquisitiveness, animal welfare is now a well-established scientific discipline. However, being a concept intrinsically related to culture and beliefs, the interpretation of what is animal welfare, how it should be measured and how it should be ensured, differs widely between people, including students and even scientists. Unavoidably two perspectives have to be considered: the scientific one (focused on facts) and the ethical one (focusing on values and judgment). This makes teaching both challenging and rewarding.

We will focus mainly on the science. The student should be aware of the needs of different species, what their natural behaviours are, what are the degrees of sentience and their capacity to adapt, but also be conscious of the purpose of some animals, how they are managed/taken care and what are their husbandry conditions. Students should then be able to build and use scientifically validated welfare assessment protocols through which environment, resources and animal indicators are recognized, appraised and graded. Pain assessment is also an example of the use of these protocols.

When presenting animal welfare to (most probably) naïve, ill-informed and unknowledgeable students, very unsettling questions will be raised. Should the definition of poor welfare be related to the species appraised? Should the boundaries of welfare be correlated with the purpose defined by humans for that animal? What are the biological differences and limits of sentience? Why some rules apply to dogs and not to pigs?

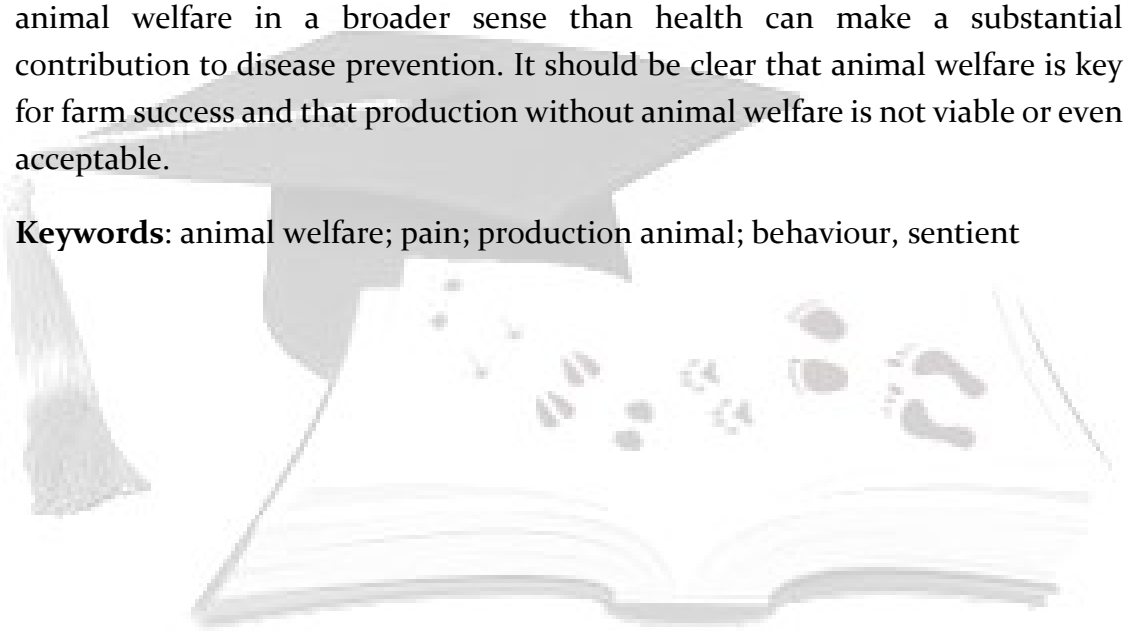
Although the answers may be within each ones' ethical views, if they are not discussed side by side with science, it will leave the student with confusing, dubious or unanswered concerns. For example, the separation of dairy calves from their dams does cause ethical concern, but are the alternatives clearly and thoroughly discussed?

In view of the above questions, we will discuss the differences and the particulars involved in the teaching of companion animals, farm animals or experimental animals' welfare.

Some thoughts should also be placed on how veterinarian treatment of animals may affect their welfare. For example, what is the impact on welfare of the use of non-conventional and not evidence-based therapeutics? Or the restriction on the use of potent analgesics, or even antimicrobials, in animal production? Or the perpetuation of life of animals affected by cancer, where suffering is expected?

Finally, efforts should be made to help students understand that concern for animal welfare in a broader sense than health can make a substantial contribution to disease prevention. It should be clear that animal welfare is key for farm success and that production without animal welfare is not viable or even acceptable.

Keywords: animal welfare; pain; production animal; behaviour, sentient



OPENING THE DOOR OF NON-HUMAN ANIMALS TO OUR MORAL ARENA

J.A. Almeida
University of Évora, Évora, Portugal

The overwhelmingly preponderant use of animals in society, since the dawn of civilization, has unquestionably been agricultural, through the concept of husbandry. The advent of intensive farming and large-scale animal use in biomedical research resulted in huge amount of sentient animal suffering. Society became aware of that reality through the mass media, animal welfare activists and philosophers. However, the Cartesian shadow in the scientific community and the ideological claim of science as "free of ethics" denied moral consideration to those sentient beings. In the 1970s and 1980s, study techniques associated with the development of neuroethology with the use of functional magnetic resonance enabled enormous advances in the knowledge of animal cognition. Nowadays "sentience" requires other capacities beyond the capacity to have positive and negative feelings, as considered by Jeremy Bentham and Peter Singer. Being sentient also presupposes the possession of more sophisticated capacities. Even so, Donald Broom (2014), summarizing the most recent findings of studies on animal cognition conclude that all vertebrates, octopuses and other mollusks, as well as crustaceans of the Decapoda Order (lobsters, crabs ...) are sentient beings. These findings raised most concern with the need to protect animals by law. "Telos" and wellbeing has emerged as a moral norm to guide animal use.

In addition, a major issue that arises today is the loss of species and habitats which poses as much a danger to life on Earth. The overwhelming power of the techno-science, coupled with human economic greed, reached a point that we are not even able to accurately predict the consequences of our actions. Knowing what we should do and what we should not do, is not an exclusive scientific task. It requires bioethical tools for the objective appraisal of how our values, desires, and actions affect others, including animals and the environment.

Our corollary is that all animal sciences students, as prerequisites for graduation, should successfully attend compulsory curricula of applied animal ethology and welfare science (in the perspective of "animal well-being"), and to complete ethics and bioethics seminars on the mains issues of their professional interest.

Main Readings

Bernard E. Rollin. University of Missouri, Publisher. A New Basis for Animal Ethics: Telos and Common Sense, First Edition, Kindle Edition, 2017. 208 p.

Donald M. Broom, Cabi Publishing, editor. Sentient and Animal Welfare, Kindle Edition, 2014. 200 p.

Fox, MW. Bioethics: Its Scope And Purpose. (1994) *Between the Species*: Vol. 10: Iss. 1, 1994, Article 13.

Michael W. Fox. Sunny Press, Publisher. *Bringing Life to Ethics: Global Bioethics for a Humane Society.* 2001. 265 p. (www.drfocvet.net)

Susan J. Armstrong and Richard G. Botzler, editors. The Animal Ethics Reader, 3rd Edition, Kindle Edition. Publisher: Routledge (2017, pdf). 1358 p.

ORAL PRESENTATIONS

LEARNING TO COMMUNICATE WITH PET OWNERS IN THE DIGITAL AGE

Joana C. Prata[1,3], João Carlos da Silva-Nogueira[2,3]

[1]Centre for Environmental and Marine Studies (CESAM) & Department of Chemistry, University of Aveiro, 3810-193 Aveiro, Portugal
[2]Higher Institute for Accountancy and Administration of Aveiro University, University of Aveiro, 3810-193 Aveiro, Portugal
[3]O Meu Animal, https://omeuanimal.com

The world has changed with the advent of the internet, including veterinary medicine. Consumers are growing eager for information, but the information obtained is often of poor quality. When there is insufficient communication between owner and veterinarian, questions remaining unanswered maybe answered in forums, websites and social media, possibly leading to unfounded criticism of the professional or cessation of the treatment, with dire consequences for the animal's health and welfare. So, how can veterinarians improve the communication with their clients and leverage digital tools to better inform pet owners? First, professional must understand the objectives and information needs of their clients. These were assessed through an online questionnaire gathering information of husbandry and information needs of 111 Portuguese pet owners. Portuguese owners are mostly focused on health preservation and less worried about complying with national laws regarding their pets. Furthermore, owners would like to learn more about wellbeing, health assessment and diet choices from their veterinarian. When these needs are not met, pet owners look for medical advice online in order to get a new perspective or a second opinion. However, not always this information is beneficial since it may be provided by non-professionals or have no scientific foundation. Even though veterinarians should take time to explain the diagnosis and treatment, often time is short to go into details. Thus, veterinarians may provide small and simple texts on their social media profiles to keep owners updated and informed. This task should be simple since it has a high cost (of time) compared to the benefit (of getting new clients). For this reason, this effort should be limited to easily manageable social media profiles instead of websites or blogs. As an alternative, veterinarians may recommend reliable websites about animal health, such as the Portuguese O Meu Animal (https://omeuanimal.com).

TURNING STUDENTS' SMARTPHONES INTO A TOOL FOR AN INTERACTIVE LEARNING ENVIRON*MENT*

Sofia Duarte[1,2]

[1]Department of Veterinary Medicine - DMV / Vasco da Gama Research Center - CIVG, Escola Universitária Vasco da Gama, Portugal;
[2]LAQV-REQUIMTE, Faculdade de Farmácia da Universidade de Coimbra, Coimbra, Portugal

In Veterinary Medicine, subjects of the fundamental scientific areas are more easily considered by the students as more tedious to study, so that they are more difficultly engaged. At the same time, the greater dimension of the theoretical classes is an added difficulty that limits, in many cases, the application and development of active learning activities in the classroom that encourage student involvement and enthusiasm on the subject.

The objective was to apply a positive reinforcement to the revision of previously taught syllabus content, thus helping students to follow the course. This flipped classroom activity further engages students by the use of their smartphones, commonly considered a distraction. In the first 15 minutes of each theoretical class of Genetics, four questions related to the subject taught in the previous theoretical class are presented through the open access platform Mentimeter® with the results depicted in real time as each question is answered. If at least 75% are answered correctly by the majority of students, at least two of the questions are used in the assessment test. In the end, the different response options are analyzed and discussed together.

Although it was not possible to assess formally the students' perceptions given that this pedagogical practice was implemented in the current semester, several advantages were already acknowledged:

- visible enthusiasm in the participation of the activity and in the healthy "competition" of knowing who answers first to the last question;
- stimulates interest and participation in the rest of the class, even if taught conventionally;
- students consolidate the contents previously taught and individually conduct self-assessment in each class;
- consolidates the group spirit, since individual students contribute to a common goal that the whole class can benefit;
- goes beyond the shyness of some students in participating actively in the assignments.

Keywords: Mentimeter; Veterinary; Genetics

PERCEPTIONS OF STUDENTS IN A VETERINARY MASTER DEGREE ABOUT THE USEFULNESS OF THE LINK BETWEEN RESEARCH AND TEACHING

Ana Cantos-Barreda[1], Damián Escribano[2], Asta Tvarijonaviciute[1], Luis J. Bernal[1], Fernando Tecles[1], Joaquín Sánchez[3], José J. Cerón[1], Silvia Martínez-Subiela[1]

[1]Interdisciplinary Laboratory of Clinical Analysis, Interlab-UMU, Regional Campus of International Excellence "Campus Mare Nostrum", University of Murcia, 30100 Espinardo, Murcia, Spain;
[2] Department of Food and Animal Science, School of veterinary medicine, Autonomous University of Barcelona
[3] Department of Histology and Anatomic Pathology, Veterinary Faculty, Regional Campus of International Excellence "Campus Mare Nostrum", University of Murcia, 30100 Espinardo, Murcia, Spain.

The transference of knowledge created through research into teaching is a very important goal in higher education (1). Research-based learning is one of the most effective ways for students to benefit from university research (2). This study aims to evaluate the students' perception about the importance of research-teaching link in three different subjects: Dermatology, Veterinary Clinical Pathology and Oncology, and Nephrology; which are taught at the Master's Degree in Small Animal Medicine (University of Murcia, Spain).

The total of the 12 students included in the Master's Degree were asked to respond a survey. It was composed of 16 questions with responses evaluated on a 6-point Likert scale, ranging from 0, strongly disagree, to 5, strongly agree; and was designed taking advantage of the product Google Consumers Surveys. The response rate was 50 % (n=6).

The results of the survey indicate that the majority of the respondents (83.3%; n=5) are aware that their professors perform research as part of their work, although don't know very clearly their research lines (50 %). The students (66.7%; n=4) agree that performing research contributes to a better teaching. Most of the students (83.3%) agree that general research results were used in theoretical classes by their professors. In addition, the students consider that showing research results at class is useful for their academic formation (83.3 %) and their future clinical practice (100 %). They think that academia and research are compatible (83.3 %). The Master's degree students (83.3 %) think that participation of Ph.D. students showing their research results is interesting, useful, and motivating. Moreover, they are satisfied with the participation of Ph.D. students at the lectures (66.6 %).

In conclusion, the students think that the use of research results into Master's Degree teaching helps them to strengthen knowledge and the intervention of Ph.D. students at lectures is considered positively.

Keywords: Master's degree; knowledge transfer; research; teaching; veterinary.

References

1. Senaratne S and Amaratunga RDG. A knowledge transfer perspective on research and teaching in higher education. In: CIB W89 International Conference on Building Education and research (BEAR). 2008. p. 323-333.
2. Healey M and Barnett R, McGraw Hill Open University Press, editors. Reshaping the University: New Relationships between Research, Scholarship and Teaching. 2005. p.67-78.

TEACHING OUTSIDE THE CLASSROOM – FIELD AND LABORATORY EXPERIENCES IN LARGE CARNIVORES RESEARCH

Lana Vranković[1], Slaven Reljić[2], Marina Habazin[2], Đuro Huber[2], Josip Kusak[2], Jasna Aladrović[1]

[1]Department of Physiology and Radiobiology, Faculty of Veterinary Medicine University of Zagreb, Zagreb, Croatia
[2]Department of Veterinary Biology, Faculty of Veterinary Medicine University of Zagreb, Zagreb, Croatia

The aim of this work was to share experiences and research results related to the training of veterinary, biology and other students to use some specific methodologies of field and laboratory work. Department of veterinary biology and Department of physiology and radiobiology of Faculty of Veterinary Medicine of the University of Zagreb (FVM) are collaborating in research involving biology, health and physiological status, as well as management of large carnivores (bear, wolf and lynx) in Croatia. The entire research is done with Faculty of Veterinary Medicine (FVM) students and students from different mobility programs (Erasmus programs) where they have the opportunity to learn about large carnivore's behaviour, biology and physiology. Regarding field work, students are learning how to recognize signs of large carnivore's presence, how to deal with telemetry equipment, how to collect different samples by invasive and non-invasive methods and how to behave in the different habitats. Regarding laboratory work, students have the opportunity to learn how to prepare samples for the biochemistry and how to interpret the results of biochemical and haematological analyses. Furthermore, they learn how to prepare samples for the analysis of fatty acid composition by the gas chromatography method. This collaboration resulted in several (three) published papers and conference presentations (eleven) where students were involved as co-authors and gathered the experience in preparing research results for dissemination. Research results also gave rise to several student master thesis and one PhD. As for conclusion, involvement of students in research, implementation of different project activities, field and laboratory work introduce them to the scientific field, where they could make an impact for the future knowledge.

Keywords: teaching outside classroom, large carnivores, students, filed work, laboratory work

THE ENFORCEMENT OF THE 3RS PRINCIPLE IN THE PRACTICAL TRAINING OF VETERINARY STUDENTS AT FMV-U LISBOA

Berta São Braz, Virgílio Almeida

CIISA – Centro de Investigação Interdisciplinar em Sanidade Animal, Faculdade de Medicina Veterinária, Universidade de Lisboa

Objective. The main objective is to discuss how, the 3Rs Principle (Replacement, Reduction and Refinement) was embedded in the Faculdade de Medicina Veterinária (FMV) – Universidade de Lisboa strategy regarding the use of live animals for teaching, demonstration and training purposes. The training of veterinary medicines administration routes at the curricular unit of Pharmacology and Therapeutics is used as example.

Material and Methods. The teaching and learning strategy for administration routes of veterinary medicines includes three stages: demonstration, execution and improvement. The 1st stage involves the demonstration by teachers of the routes of administration in several animal species kept at FMV premises, namely dogs, horses, cows, sheep and goats. Then the 2nd stage takes place at the Clinical Skills and Simulation Centre, open since 2017, where a mix of self-made dog and full-size, realistic and advanced canine and feline manikins and equine models are available. In these manikins and models, students enjoy risk-free and realistic hands-on training for medicines administration via intravenous, subcutaneous and intramuscular routes. They may book this facility, to deepen their skills with coaching of veterinary practitioners. Finally, the 3rd stage is carried out in client-owned animals at the Veterinary Teaching Hospital (companion animals and horses) and at the Ambulatory Clinics (ruminants, pigs and poultry), under the guidance of teachers and veterinary practitioners.

Results and Conclusions. The implementation of this student-centered learning approach in the practical classes of Pharmacology and Therapeutics resulted on a major reduction of the number of live animals used in training sessions, and allowed for an improvement of the student's technical skills and student's self-confidence to work with client-owned animals in complex operating healthcare systems. A similar approach is in force at other curricular units, including Anesthesia and Analgesia, Medical and Surgical Propaedeutics, Reproduction and Obstetrics, and Clinical Rotations (Basic and Advanced Life Support).

Keywords: Replacement, Reduction, Live animals, Models, Manikins

References

Aulmann M, März M, Burgener IA, Alef M, Otto S, Mülling CK. Development and Evaluation of Two Canine Low-Fidelity Simulation Models. J Vet Med Educ. (2015);42(2):151-60.

Baillie, Sarah. Utilisation of simulators in veterinary training. Cattle Practice. (2007); 15. 224-228.

Scalese, R.J., Issenberg, S.B. Effective Use of Simulations for the Teaching and Acquisition of Veterinary Professional and Clinical Skills. Journal of Veterinary Medical Education. (2005); 32(4):461-467.

AN INNOVATIVE PEDAGOGICAL APPROACH, BASED ON THE DELPHI METHOD, TO SUPPORT ANIMAL WELFARE TEACHING

Ana Vieira[1], Mónica Oliveira[2], Teresa Letra Mateus[3], Jean-Pierre Durieux[4], Jean-Baptiste Menassol[5], Benoit Girard[6], Michel Vidal[7]

[1] CEG-IST, Instituto Superior Técnico, Universidade de Lisboa, Portugal;
[2] CEG-IST, Instituto Superior Técnico, Universidade de Lisboa, Portugal;
[3] Escola Universitária Vasco da Gama, Portugal; Escola Superior Agrária, Instituto Politécnico de Viana do Castelo, Portugal; EpiUnit - ISPUP, Universidade do Porto, Portugal;
[4] S.E.N.S., Belgium;
[5] Montpellier SupAgro, France;
[6] EPLEFPA de La Côte Saint André, France;
[7] Montpellier SupAgro, France.

Animal welfare can be considered as a controverted topic (1), with multiple (sometimes extreme) ethical and scientific perspectives being observed. Accordingly, the teaching of animal welfare is a challenge both for educators and learners. Departing from the socio-constructivist learning approach of the socially acute questions (2), where reflection and debate around these topics play a major role in teaching, we found scope for developing a new pedagogical approach to animal welfare.

The main objective of this work was to design and implement an innovative pedagogical approach, based on the Delphi method (3) and making use of new technological web-platforms (WELPHI). The approach makes use of the iterative nature of the Delphi method as a learning process to generate both reflection and (non-face-to-face) debate among learners, with individual reflection from learners being prompted by a set of problem-situations and videos depicting related husbandry practices. The debate takes place in follow-up Delphi rounds where learners are faced with the perspectives, practices, experiences and values other than their own (i.e. from other learners). The educators assume the role of process facilitators in the proposed approach.

The proposed pedagogical approach was designed and implemented within the scope of the ANICARE project, with implementation being enabled by the creation of a tailor-made Web-Delphi platform. The ANICARE platform allows educators to implement the ANICARE Delphi approach in their own educational realities and was already tested by several educators for different animal welfare topics, having shown to allow learners to develop critical, ethical and creative thinking, by creating a dialogue between values, experiential knowledge and scientific knowledge. Experience from designing and testing the platform suggests that for enhancing discussion and learning among trainees, the use of the platform must be integrated into an open and distance learning strategy, combining classroom and distance time.

Keywords: animal welfare teaching; Delphi method; critical thinking; ethical thinking; creative thinking

References

(1) Vidal M., Simonneaux L. Les enseignants refroidissent la question socialement vive du bien-être animal. Penser l'éducation. 2013; Hors Série: 431–446.
(2) Legardez A., Simonneaux L. L'école à l'épreuve de l'actualité. Enseigner les questions socialement vives. Ed.: ESF; 2006. 246 p.
(3) Linstone H.A., Turoff M. Delphi: A brief look backward and forward. Technological Forecasting and Social Change. 2011; 78(9): 1712–1719.

ANICARE - EDUCATE ANIMAL WELFARE AS A FARMING OPPORTUNITY

Manuel Magalhães-Sant'Ana[1], Michel Vidal[2] et al.[3]

[1.] CIISA, Faculdade de Medicina Veterinária, Universidade de Lisboa, Lisboa, Portugal

[2] Montpellier SupAgro, Florac, France

[3] The ANICARE team also includes: Santos, A.S. (Ruralidade Verde, Portugal), Mateus, T., Martins, E. (EUVG, Portugal), Dantas, M. (Coopalima, Portugal), Vieira A.C.L., Oliveira, M.D. (CEG-IST, Instituto Superior Técnico, Universidade de Lisboa, Portugal), Stilwell, G. (CIISA-FMV-UL), Facorro, J. G., Leis, R. (Federacion EFA Galicia, Spain), Girard, B. (EPLEFPA de La Côte Saint André, France), Ilmonen, J (Omppu Tonttu Luomutila, Finland), Durieux, J.P (S.E.N.S., Belgium), Menassol, J.B. and Azema, C (Montpellier SupAgro, France).

Anicare[1] is a European project aiming to create a pedagogical toolkit for teaching farm animal welfare. It focuses on ruminant husbandry (dairy cows, dairy goats and meat sheep) from five European countries: Belgium, Finland, France, Portugal and Spain. Based on farmers' views of animal welfare, Anicare combines a theory-based didactic approach with a socio-constructivist problem-based approach to the issues.

Anicare involves introducing students to socially and scientifically controversial issues. A series of short movies (3-7 minutes) were created describing different rationales for farm animal husbandry procedures, namely feeding, milking, bedding, disbudding and herding. Farmers were then confronted with their own practices, from an animal welfare point of view, using explicitation interviews (1). All videos were translated into English (some have also been translated into additional languages) and uploaded into the project's website (https://erasmus-anicare.eu/). A Web-based Delphi process was created combining the farmers' videos with Likert-scale and open-ended questions on animal husbandry and welfare. The pedagogical toolkit involves combining the didactic of socially acute questions (2), with the Web-Delphi (3) and peer-to-peer debates with students.

The main pedagogical principle is *'estrangement',* "a process or an art which subtracts the automatism of perception established by habit" (4). Animal welfare is approached, not as a pre-defined and standardized set of facts, but as an embodiment of controversies, giving the learner the possibility to reflect, to respect others' opinions, and learn through the debate. The pedagogical toolkit can be implemented in many training situations, both formal and informal, and at different levels, where peer to peer exchanges are possible. Anicare is currently being tested with students, farmers and educators. It is expected that it will promote critical, ethical and creative thinking, in order to inspire a behavioral change, while respecting farmers' views of animal welfare.

1. ANICARE is a ERASMUS+ project funded through grant 2017-1-FR01-KA202-037287.

Keywords: Animal welfare teaching; farmers; estrangement; video; Delphi

References

1. Vermersch P. L'entretien d'explicitation. 6ème édition. ESF éditeur; 2010. 220 p.
2. Legardez, A., & Simonneaux, L. L'école à l'épreuve de l'actualité. Enseigner les questions socialement vives. ESF éditeur, 2006
3. Gill FJ, Leslie GD, Grech C, Latour JM. Using a web-based survey tool to undertake a Delphi study: Application for nurse education research. Nurse Education Today. 2013 Nov 1;33(11):1322–8.
4. Ginzburg C. Making Things Strange: The Prehistory of a Literary Device. Representations. 1996;(56):8–28.

ÉVORA CHEESE PRODUCTION SYSTEMS: TEACHING AND LEARNING WITH A UNIVERSITY-ENTERPRISE COOPERATION

Cristina Conceição[1,2], Flávio Silva[1], Ana Lúcia Garrido[1], Graça Machado[1,2], Eduarda Potes [1,3]

[1]Departamento de Zootecnia, Universidade de Évora, Portugal;
[2]ICAAM, Universidade de Évora, Portugal;
[3]Departamento de Medicina Veterinária, Universidade de Évora, Portugal

Academic education is a multifactorial process with the purpose of acquiring knowledge, values and skills, through collecting information, teaching, discussion, training and research.

The research lines and consequent teaching on the subject of Évora cheese production systems has been approached over the years in a holistic way, passing on to students the linkage of university and the cheese factories, concerning four steps of investigation: hypothesis; data collecting; results and conclusions.

According to Gilles and Lawrence (1), the quality of a cheese is determined by its physical, biochemical and sensory characteristics. The relative importance of these characteristics varies according to the type of cheese and is based on the animal production systems and technology of process that determines the specific features of Évora cheese (2,3).

Several research projects have been carried out with the purpose of discriminating the factors that confer specific "typical" characteristics of a product originated from a "terroir", outcoming PhD thesis, MSc dissertations, traineeships, articles peer-review, index journals, publications in the book of abstracts and also several communications in national and international symposiums.

Keywords: Évora cheese, milk, system production, microbiological parameters

References

1. Gilles J, Lawrence RC. Assessment of Cheddar cheese quality by compositional analysis. New Zealand Journal of Dairy Science and Technology. 1973;
2. Pinheiro CMSC. Contributo para a caracterização do queijo de ovelha produzido na região de Évora: Aspectos químicos, bioquímicos do leite obtido em diferentes sistemas de produção e físico-químicos, bioquímicos, tecnológicos e organolépticos do queijo. Universidade de Évora; 2002.
3. Potes MEMMD. Microbiologia do queijo artesanal produzido na região de Évora. University of Évora; 2000.
4. Scintu MF, Piredda G. Typicity and biodiversity of goat and sheep milk products. Small Rumin Res. 2007;68(1–2):221–31.

Poster presentations

INCREASING INTEREST IN THE ACADEMIC RESEARCH CAREER PATH IN BSC IN BIOLOGY STUDENTS

Beatriz Fernandez-Fuertes, Isabel Barranco, Marc Yeste

Unit of Cell Biology, Department of Biology, University of Girona, Girona, Spain

Although academic research is a common career option for bachelors of biology, sometimes students are not provided with enough or adequate information on the matter. The aim of this study was to identify student interest towards the scientific career and level of knowledge on the Spanish career path. To this end, a survey was conducted in a small cohort (n= 35) of final year students at the University of Girona. Results evidenced a lack of knowledge on what this career entails or how to access it. Surprisingly, 91% of students believed that having a grade point average below 8/10 barred them from taking on a PhD, and only 54% had considered applying to a position abroad. Based on this information, 2 h from an elective module were allocated to give a seminar on the matter. The students were also given the option to visit the laboratory in which the authors conduct their research, for which they had to sign their names on a list. The seminar consisted of short talks from members of our research group (ranging from Masters students to a senior PI) on the scientific career in Spain and abroad, transferrable skills that are acquired, and the Spanish government-funded grants available and their requirements. Prior to the seminar, only 23% of students had signed up for this activity, while after the seminar 71% had expressed their interest to attend. These results indicate a degree of misinformation about the scientific career in undergraduate students which leads them to believe they are not qualified to embark on this path. Allocating time to explain the different options available increases the interest to follow this career option. Boosting the number of people that go into science can have a tremendous impact in the future of Spanish R&D output.

Keywords: Academic research; scientific career; student engagement

BUILDING COMPETENCES THROUGH THE HIGHER EDUCATION PROGRAMMES

Catarina Lavrador[1], Fernando Capela e Silva[2], Rita Payan[3]

[1]Departamento de Medicina Veterinária, Escola de Ciências e Tecnologias e Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Portugal. E-mail: clavrador@uevora.pt
[2]Departamento de Biologia, Escola de Ciências e Tecnologias e Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Portugal. E-mail: fcs@uevora.pt
[3]Departamento de Medicina Veterinária, Escola de Ciências e Tecnologias e Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Portugal. E-mail: rtpayan@uevora.pt

Rapid changes in technology and the work organization contribute to the mismatch between labor market needs and skills at graduation provided by the Higher Education Institutions (HEI). Today's global economy requests from graduates that they have the competencies at day-1 suiting the workplace, including critical thinking, adaptability, autonomy, teamwork, and communication. Despite the adoption of the Bologna paradigm, in most Portuguese HEI, however, learning remains too focused on cognitive achievements (which are clearly defined in the outcomes proposed and assessed in a course) while core competencies are often left behind.

Even though no agreement has been reached in its definition, competency may be understood as a set of abilities or skills organized around a core knowledge (Boyatzis, 2008). Fast changes in the workplace are putting pressure on educational systems to change their academic approaches towards developing new generations. In particular, it has been shown that the acquisition of academic competencies may vary across domains and that they are more successfully acquired in some specific contexts than others (OECD 2013). In addition, some defended that reasoning skills (such as Critical Thinking or Clinical reasoning, and all other soft skills) should be developed through graduation and assessed accordingly. To engage in competency-based learning, it is necessary that HEI change both how they devise and carry out their instructional practices as well as the way professional competencies are perceived. Teachers ought to move towards a position where they are facilitators, who structure situations that help students find and build knowledge; introducing new, active methodologies for learning, and moving from assessing knowledge to assess competencies. This work intends to alert the academic community to the need for change, to drive the excellence and attractiveness of the university, and to identify ongoing pedagogical changes, helpful to building competencies in undergraduate studies.

Keywords: Graduation, Competencies, Change of practices, Skills acquisition

OECD (Organisation for Economic Co-operation and Development). AHELO Feasibility Study

Report, volume 2, Data Analysis and National Experiences. Paris: OECD; 2013. 197 p.
Boyatzis RE. Competencies in the 21st century. Journal of Management Development 2008; 27(1):5-12.

THE USE OF PORTFOLIOS TO ENHANCE SELF-REGULATED LEARNING SKILLS

Aniceto Mendéz Sanchés[1], Pilar Gui Alcala[1], Maria dos Anjos Pires[2], Rita Payan Carreira[3]

[1] Departamento de Anatomia Patológica e Anatomia Comparadas, Universidade de Cordoba, Espanha
[2] Departamento de Ciências Veterinárias, Universidade de Trás-os-Montes e Alto Douro, Vila Real, Portugal
[3] Departamento de Medicina Veterinária, Escola de Ciências e Tecnologias e Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Portugal. E-mail: rtpayan@uevora.pt

The implementation of Bologna process brought a profound shift to the learning paradigm, challenging higher education institutions to move to student-centered learning – in which the teacher is responsible for ensuring the quality of the learning process encouraging students to assume an active role in the achievement of the expected learning outcomes.

Self-direct learning can be foster with the use of learning portfolios, which will support students learning, endorse the acquisition of skills and also drive the development of auto-regulation competencies. Besides, portfolios can be used for formative as well as in summative assessment. Among its different uses, it can be used as an alternative format to assess prior and potential knowledge, to structure in-field traineeships, to provide regular feedback on achievements, to assess skills/knowledge growth, to foster autonomy, and also for students to reflect on their learning process and identify putative gaps. In brief, it will be a major asset in engaging students in the learning process and fostering their critical thinking as well as to assess the progress of students through a Program.

In this work the authors intend to overview the introduction of portfolios as component of the practical classes in the General Pathology and Anatomopathological courses, in the Veterinary Medicine Integrated Master in Portugal (Universidade de Trás-os-Montes e Alto Douro) and Spain (Universidad de Córdoba). It will also be discussed the usefulness of portfolios in students´ formative and summative assessment and the perceived benefits and barriers to the implementation of this pedagogical tool in a course.

Keywords: Self-learning; Skills acquisition; Portfolios; Veterinary Medicine

SYLLABUS AND FLIPPED RESOURCES- NEW PEDAGOGICAL APPROACHES

Graça Alexandre Pires[1] and Graça Ferreira-Dias[1, 2]

[1]Department of Morphology and Function- Centre for Interdisciplinary Research in Animal Health, Faculty of Veterinary Medicine, University of Lisbon, Lisbon
[2]Morphology and Function Dept. coordinator of Integrative Master's degree studies.

INTRODUCTION: As academic staff, we focus in "the day one skills", those that ensure that undergraduates are well prepared when starting their first job, with competence and confidence. Other skills have been gaining importance (not negligible ones), known as interpersonal and soft skills. Discussing these issues, the authors have been interested in evaluating learning possibilities in the morphology laboratory. The paradigm of working on cadavers as the best way to allow the tridimensional reasoning necessary for understanding the real construction of the body, and how it jumps into other subjects are kept in mind. Introduction of artistic constructions as a facilitator of the learning process and interpersonal skills is also a goal.

METHODS: The cadaver as the most useful tool to build up accurate comprehension over the relation and spatial organization of structures is always a hot subject as we deal with ethic and budget constraints. Our pedagogical approach relies in the use of a minimum of conserved cadavers (glycerination). Students are divided into groups, some identifying structures, some looking in the iPad/ books for the related information (what function?). Students are responsible for the active process of learning. A final report is mandatory.

The second part of the pedagogical project relies in the introduction of art as a mechanism to achieve the development of group dynamic activities. Small groups of students choose a morphological topic and represent it in models. They investigate, improve problem-solving skills, and build up the project and report that summarizes the reality behind it.

RESULTS and CONCLUSIONS: We get a much more involved audience by using in the same classroom students involved with different tasks and producing a final report. We reduce and reuse. The artistic project comprises research for the development of the cognitive process and prepares better students to the practice of their profession as explores interpersonal work.

Funding: CIISA: UID/CVT/00276/2019

Keywords: anatomical lab resources, glycerination, reuse/reduce, art in veterinary education.

THE ROLE OF ABROAD INTERNSHIPS IN LEARNING FROM DIFFERENCES: ROQUEFORT VS ÉVORA CHEESE PRODUCTION SYSTEMS

Elvira Sales-Baptista[1], Pierre-Alexandre Jolly[2], Manuel Cancela d'Abreu[1]

[1] Instituto de Ciências Agrárias e Ambientais Mediterrânicas (ICAAM), Departamento de Zootecnia, Universidade de Évora, P.O. Box 94, 7002-554 Évora, Portugal;
[2] École Nationale Vétérinaire d'Alfort, 94700 Maisons-Alfort, France

The National Veterinary School of Alfort (EnvA) requires training students to undertake an internship abroad. Academic internships have a positive effect on academic outcomes because they provide a community-based work experience and allow to develop networking connections (Binder et al. 2015).

As the internship' social environment is key for students learning (Jaarsma et al, 2009) we reported an experience-based account of an EnvA internship at the University of Évora, that compared two different sheep milk production systems, supporting AOP/DOP cheeses (Roquefort and Évora). We highlight the increase of understanding that is possible through analysing social, economic, and technical different realities.

Besides the sheep breeds (Lacaune and Saloia), one of the major differences between both systems is the feeding system. In the Évora system, animals graze all year round. Pasture is supplemented differently through lactation but on an empirical basis. In the Roquefort system, sheep only graze from spring to autumn but farmers have an accurate knowledge of the nutritional value of feedstuffs allowing the preparation of balanced diets.

Another difference is lambing. In the Roquefort system the milk production is based on just one flock producing milk for 5 month after feeding their lambs up to 1 month old, whereas in Évora system the milk cycle is shorter. To overcome the limitation the flock is divided in 4 groups to allow for lambing to occur every 3 months, and lambs after 4 days are milk-fed artificially.

The social and economic aspects surrounding both systems are also distinct. The Roquefort system is family-based, and the roles of the veterinary and technical association's are essential, as producers are abide by stringent specifications, while in Évora is an agribusiness where the producer rely mostly on his own decisions. We conclude that learning from differences broadened the awareness for the production systems.

Keywords: Training; Abroad Internship; Academic performance; Student achievement; Production Systems

References

Binder JF, Baguley T, Crook C, Miller F. The academic value of internships: Benefits across disciplines and student backgrounds. Contemporary Educational Psychology, 2015, 41:73-82.

Jaarsma DA, Muijtjens AM, Dolmans DH, Schuurmans EM, Van Beukelen P, Scherpbier AJ. Undergraduate research internships: Veterinary students' experiences and the relation with internship quality. Medical Teacher, 2009, 31(5): e178-e184.

EXPERIENCE IN LECTURING OF PHYSIOLOGY OF DOMESTIC ANIMALS IN ENGLISH LANGUAGE IN CROATIA

Jasna Aladrović[1], LanaVranković[1], Ana Shek Vugrovečki[1], Ivona Žura Žaja[1], Jadranka Pejaković Hlede[1], Blanka Beer Ljubić[2]

[1]Department of Physiology and Radiobiology, Faculty of Veterinary Medicine, University of Zagreb, Croatia
[2]Clinic for Internal Diseases, Faculty of Veterinary Medicine, University of Zagreb, Croatia

Faculty of Veterinary Medicine (FVM), University of Zagreb was founded in 1919. Since academic year 2015/16 FVM Zagreb offers university graduate course, which is conducted as an integrated under-graduate and graduate course in veterinary medicine and lasts 6 years (12 semesters). Upon completion, the academic title of Doctor of Veterinary Medicine is awarded and a diploma is fully recognised throughout the EU. Objectives of this study were to evaluate student work in class and at the final exam on Physiology of domestic animals I course (PDA I) by comparing the results of students in Croatian program (CP) and foreign students studying in English program (EP) during the two academic years, 2017/2018 (year I) and 2018/2019 (year II). In the year I, PDA I in EP was enrolled by 6 students (two from Israel, one from Greece, France, Hungary and Slovenia), and in the year II by 12 students (three from Germany, two from France and England, one from Lebanon, Finland, Canada and Croatia). In the year I, PDA I in CP was enrolled by 113 students and in the year II by 122 students. During semester, a student must gain points from lecture and practical class attending, practical class activity, two tests and oral final exam. All students studying in EP in year I fail to pass first test comprises general and blood physiology, and 50% in the year II. Second test, which comprises muscle and nervous systems physiology, 50% in both generations of students studying in EP failed to pass. These results are probably due to inappropriate terminology and lack of detailed explanation how to fulfil tests. Number of points gained in second test was significantly higher in students in CP ($p=0.021$) and points gained from lecture and practical class attending and practical class activity was significantly lower compared to students in EP ($p=0.022$). All other measured parameters were similar in students in both programs. In conclusion, the number of students in the first two generations was as small as our English language teaching experience. Communicating with the students in the EP, we changed and improved the teaching materials and adapted the presentation mode to allow studying in a stimulating environment for all students at FVM Zagreb.

Keywords: FVM Zagreb, Croatian veterinary medicine program, veterinary medicine program in English language

A MASTER'S DEGREE RESEARCH: PROTEOMIC APPROACH ON EWE'S CHEESE

Ana Lúcia Garrido[1], Flávio Silva[1], Cristina Conceição[1,2], Sofia Freitas[1], Elsa Lamy[2]

[1]Departamento de Zootecnia, Universidade de Évora, Portugal;
[2]ICAAM, Universidade de Évora, Portugal;

A master's programme structure is usually flexible and involves a comparably dissertation that is based on a research or a practice-led research project. It involves a scientific exploration that helps students obtaining investigation skills and acquiring some transversal competences. The main challenge of this academic process is to build an idea, identify the problematic, organize the hypothesis and stablishing the best methodology to get answers according to the objectives. This master's degree research was developed within a multidisciplinary project, and the main objective was to investigate which proteomic methodology was better to investigate the degradation of cheese nitrogen fractions, with the resources available at University of Évora.

Ewe's cheeses have great tradition in Portugal, and have a high intrinsic value, arising from their very appreciated unique sensory characteristics, coupled with long-recognized social and economic impacts. Therefore, it's mandatory to understand the metabolic pathways in cheese ripening, and specifically, proteolysis. Three electrophoretic techniques have been used: urea polyacrylamide gel electrophoresis (Urea-PAGE) and sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) for the insoluble fraction of cheese and two-dimensional gel electrophoresis (2-DE) for the soluble fraction.

Results showed that urea-PAGE was the best method for cheese insoluble fraction analysis, mainly because it separates proteins not only by molecular mass, but also having charge into account, and since caseins have similar molecular masses SDS-PAGE is not able to separate them (1–3). This research investigation also concluded that both urea-PAGE and 2-DE methods are complementary in the study of proteolysis of ewe's cheese. Urea-PAGE results showed a degradation of the insoluble fraction, the caseins, during maturation, and the 2-DE showed an increase of the soluble fraction, that according to other results (3) we believe that are peptides resulting from the degradation of caseins.

Keywords: ewe's cheese; proteolysis; electrophoresis; caseins.

References

1. Shalabi S, Fox P. Electrophoretic analysis of cheese: comparison of methods. Irish J Food Sci Technol. 1987;
2. Veloso ACA, Teixeira N, Ferreira IMPLVO. Separation and quantification of the major casein fractions by reverse-phase high-performance liquid chromatography and urea-polyacrylamide gel electrophoresis: Detection of milk adulterations. J Chromatogr A. 2002;
3. Ordiales E, Martín A, Benito MJ, Hernández A, Ruiz- Moyano S, Córdoba M de G. Technological characterisation by free zone capillary

electrophoresis (FCZE) of the vegetable rennet (Cynara cardunculus) used in “Torta del Casar.” Food Chem. 2012;133:227–35.

IMPLEMENTING PROBLEM-BASED LEARNING IN ONE MODULE OF A MASTER COURSE IN MOLECULAR BIOLOGY AND BIOMEDICINE: SATISFACTION OF STUDENTS

Marc Yeste, Elisabeth Pinart, Isabel Barranco, Beatriz Fernandez-Fuertes

Unit of Cell Biology, Department of Biology, University of Girona, Spain

The Master Course in Molecular Biology and Biomedicine is a one-year, residential MSc Course taught at the University of Girona, Spain. The Course comprises 60 ECTS, including compulsory, optional and practical subjects. One of the compulsory subjects, 'Cell Structure and Function', had been previously taught through conventional lectures. During the current academic year (2018-2019), we have implemented a Problem-Based Learning method to teach this Module. Students (N=25) were split into two groups (12 and 13, respectively), each group being assigned a tutor. Three separate problems together with their learning objectives were devised, each being tackled through three sessions. In the first session, the problem was introduced and the students were invited to discuss the scenario given and to suggest the objectives and write them down. Following this, the students worked in groups of two people and picked one of the learning objectives up. During the next session, the students presented the learning objectives and, at the end of the session, they were given the list prepared by the tutors. Conclusions for each problem were drawn in the last session. At the end of the course, a conventional lecture involving all the 25 students served to integrate the knowledge and provide a stronger narrative. The students were assessed with a PBL-exam, which consisted of a problem and short related-questions. In addition, the students were given a questionnaire to evaluate their satisfaction (4.7/5). This score was higher than that obtained in the previous academic years, where students gave a satisfaction of 4.2 (2016-17) and 4.4 (2017-18). In conclusion, delivering 'Cell Structure and Function' subject using the PBL-approach has increased the satisfaction of the students in the MSc Course in Molecular Biology and Biomedicine at the University of Girona. Based on the students' feedback, we will organise the next academic year with four problems and we will also recommend this teaching philosophy for other related MSc courses.

Keywords*:* Problem-Based Learning; Master Course; Molecular Biology; Cell Biology; Biomedicine

TEACHING AND LEARNING BEYOND-THE-BOOKS: DAIRY FARM EXPERIENCES

Flávio Silva[1], Ana Lúcia Garrido[1], Cristina Conceição[1,2]

[1]Departamento de Zootecnia, Universidade de Évora, Portugal;
[2]ICAAM, Universidade de Évora, Portugal;

Dairy science has a great relevance in agriculture and in Animal Sciences education. In the European Union the total cow's milk collected, by dairy farms rounds the 154 million tonnes in 2017 (see Figure 1.) (1). For a better student's acquisition of knowledge and skills, the learning process needs to have a theoretical and practical approach. Therefore, field trips and academic internships into dairy farms, with protocols with universities, can strongly contribute to the student's academic learning (2). Academic institutions, with experimental farms, have a great relevance since students can have a daily practice and have a responsibility for various kind of activities. The Science and Technological School of Évora's University holds an experimental farm called Herdade da Mitra, that is managed in partnership with Z.E.A. - Sociedade Agrícola Unipessoal, Lda, and protocols with commercial dairy farms that are open to receive students and give them the opportunity to evolve and develop their skills acquired at university.

At the experimental farm the aim is self-sustainability and to lend the opportunity for the Animal's Science, Zootechny, Agronomy and Veterinary students to practice what they learn inside the classroom. The farm activities supervised by the teachers give student's competences on dairy farm management: nutrition, reproduction, milking and animal health and welfare. At the commercial farms, besides a business and good dairy farms practices' knowledge, it's of huge importance a symbiotic relationship between the dairy farm manager and the students, supplemented by the academic supervisor.

Teaching and learning beyond-the-books aids students to quickly progress into farm managers, acquire tools for research work and have more employment opportunities

Keywords: dairy farms; education; outside classroom.

References

1. Eurostat. Milk and milk product statistics [Internet]. 2017. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Milk_and_milk_product_statistics#Milk_production
2. Kitchen and Sebright. Students Gain Hand-On Experience Through Dairy Farm Internships. Farmshine newspaper. 2013

ANNEX

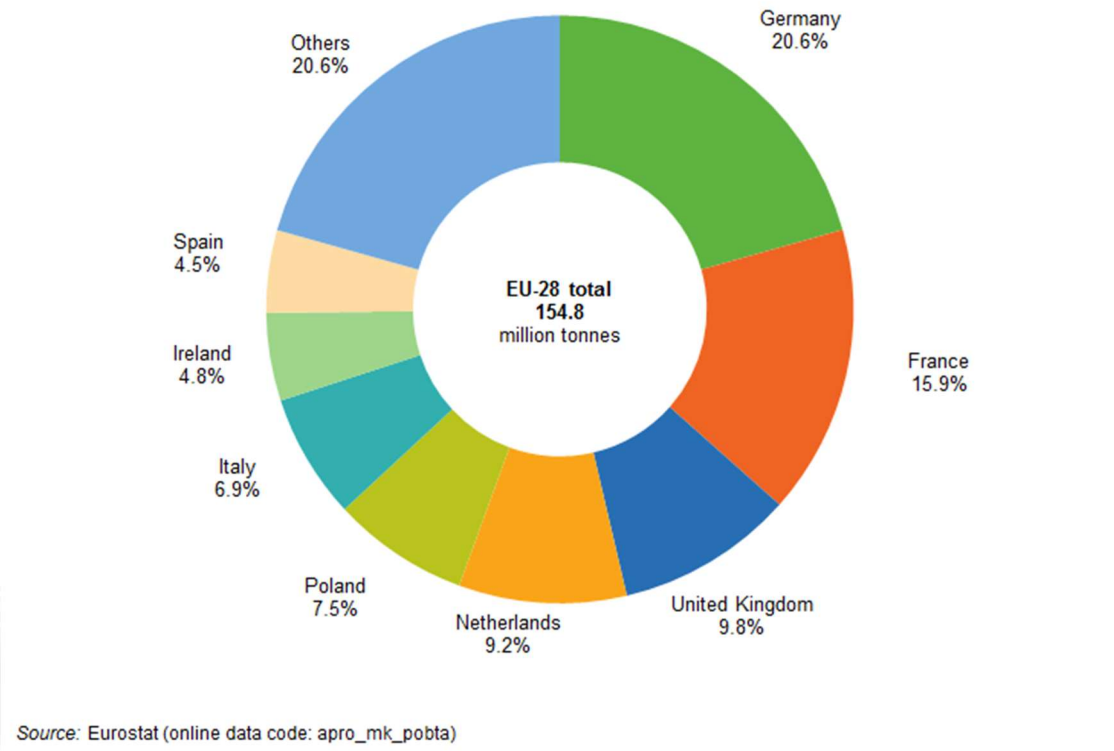


Figure 1 Collection of cow's milk by dairies, 2017 (% share of EU-28 total, tonnes)

TEACHING OUTSIDE THE CLASSROOM IN SANITARY INSPECTION CURRICULUM - AN OVERALL VIEW OF THE FISH AND FISHERY CONTENTS

Sónia Lucena[1,2]; Maria Eduarda Potes[1,2]

[1]Instituto de Ciências Agrárias e Ambientais Mediterrânicas (ICAAM), Évora, Portugal; [2]Departamento de Medicina Veterinária, Escola de Ciências e Tecnologia, Universidade de Évora, Évora, Portugal.

The main objective of this work is to share and explain how teaching outside the classroom has been gradually implemented in the fish and fishery contents on the curricular units of Sanitary Inspection of the Master's in Veterinary Medicine at the Universidade de Évora (Portugal). The implemented strategy comprises the collaboration of veterinary services with fish industry stakeholders for demonstration and training purposes.

Considering the fish and fishery contents, the teaching/learning process of an official veterinarian daily routine embraces several steps. These steps include the demonstration, execution and improvement of veterinary interventions and decisions. The daily routine includes veterinary actions in several working fields namely in local aquaculture, frozen fish processing companies, companies for shellfish purification and dispatch, and daily routine in fishing docks. The interventions and decisions in this last field comprise several steps including inspection of fishing vessels, fishing dock's tackle and gear, workers accoutrements and sanitary inspection of fish.

Thus, regarding field work, the first step of the learning-teaching process outside the classroom of the curricular unit of Sanitary Inspection is the student's displacement at different fish processing companies, plants and fishing docks. The displacements of students allow not only the observation of the worker itself, the headman, and the employer, but also the opportunity to learn about sanitary inspection methodologies and decisions. Furthermore, the contact with workers, headman and employer as well, contributes to improve student's communications skills. The collaboration of veterinary services and local fish companies and fish plants allows these students' presence in environment risk-free areas and realistic hands-on experiences, resulting in increased interest by the students in these areas.

To conclude, involvement of students in the work field of different project activities and companies, allows student's introduction to the real work field, and it has an important impact for their future knowledge.

Keywords: teaching, outside classroom, fish, students, sanitary inspection

THE EVOLUTION OF THE PRACTICAL EDUCATION OF THE ANATOMY UNITS OF THE VETERINARY MEDICINE IN THE UNIVERSITY OF ÉVORA: USE OF CORPSES: PRIVILEGE OR TRIVIALITY?

Ricardo Romão[1], Ana Luísa Almeida[1], Andreia Santos[2], Maria João Lança[1]

[1]Departamento de Zootecnia, ECT, Universidade de Évora, Largo dos Colegiais 2, 7004-516 Évora, Portugal
[2]Departamento de Clínicas Veterinárias, Instituto de Ciências Biomédicas de Abel Salazar da Universidade do Porto

For many years in anatomical classes it has been usual to use corpses for both the initiation of the procedures and the study of morphology. With the EU Directive 2010/63/EU that states that "*the use of animals for scientific or educational purposes should therefore only be considered where a non-animal alternative is unavailable*", the indiscriminate use of animals in the veterinarian's teaching was altered. At the same time students began to be sensitized to animal behavior and welfare and to the fact that animals are sentient beings.

In our classroom context, the student is initially oriented to the use of anatomical models (mannequins) and then to the use of virtual material. Acquired these skills, the students go to classes using biological material previously fixed in formaldehyde and then preserved in a 30% aqueous solution of sodium chloride. The use of sodium chloride as an alternative to the material fixed in formaldehyde has the advantage of having no odors, showing no color and texture change, being non-toxic and not allowing contamination by microorganisms. But the biggest advantage is allowing easy handling of the muscular structures for study.

Finally, at the end of the learning the student can use corpses, this being a privilege and never a triviality. This enables the future veterinary surgeon to acquire unique skills with *hands on*, but only after having practiced in a variety of other alternative means. This approach allows the student to be sensitized to the fact that the use of corpses is a privilege which is increasingly a result of the consent of the owners of the euthanized animals and / or animals that died of natural causes. This procedure has resulted in a greater sensitization of students to the problem of animal ethics.

Keywords: anatomy; cadavers; ethics; models; veterinary

VOLUNTEER STUDENTS' KNOWLEDGE ABOUT THE IMPORTANCE OF PREANALYTICAL PHASE IN LABORATORY DIAGNOSTICS

Blanka Beer Ljubić[1], Jelena Gotić[1], Ivana Kiš[1], Lana Vranković[2], Jasna Aladrović[2]

[1]Clinic for Internal Diseases, Faculty of Veterinary Medicine, University of Zagreb, Croatia
[2]Department of Physiology and Radiobiology, Faculty of Veterinary Medicine, University of Zagreb, Croatia

Laboratory diagnostics consists of preanalytical (sampling, sample labeling, handling, storage, transportation and tests order), analytical (sample measurement) and postanalytical (results transmission) phases. Preanalytical phase is the most important for the sample quality and subsequently for the final laboratory results. The aim of the study was to assess the level of knowledge on preanalytical phase in group of students volunteering in Clinic for Internal Diseases, Faculty of Veterinary Medicine, University of Zagreb.

The study was conducted by using anonymous online questionnaire with ten statements related to the preanalytical phase. The questionnaire was prepared with Google Forms and sent via email to students.

Study included ten volunteers and eight had more than 8 correct answers. Results showed that students are aware of the importance of correct sample-labeling (100%) as well as proper choice of anticoagulant (90%). Students understand relevance of blood and anticoagulant ratio (100%) and handling the sample after sampling with anticoagulant (100%). Although they know that blood samples in tubes with red and yellow caps should not be mixed (100%), 60% are not aware that serum sample from tube with red cap should be separate immediately before storage. Similarly, volunteers know that hemolysis and lipemia are the most frequent interferences in serum (90%) but 50% of them do not know that hematuria interferes with total protein concentration in urine. Statements on storage (40%) and test ordering (40%) showed that volunteers do not have satisfying levels of knowledge.

In conclusion, responses indicate that volunteers are aware of importance of preanalytical phase but their knowledge of all variables include in preanalytical processes should be improved. Results suggest the necessity of implementing preanalytical protocols in education programs in order to improve analytical accuracy resulting in adequate diagnosis and increased patient safety.

Keywords: preanalytical phase; volunteers; questionnaire

INCREASE IN STUDENT SATISFACTION AND COMPREHENSION AFTER IMPLEMENTATION OF HANDS-ON PRACTICALS IN A REPRODUCTION AND DEVELOPMENT MODULE

Isabel Barranco, Marc Yeste, Beatriz Fernandez-Fuertes

Unit of Cell Biology, Department of Biology, University of Girona, Girona, Spain.

Practical-skill learning is an essential part of Bachelor (BSc) of Biology at the University of Girona which leads to a competent biologist graduate. In this syllabus, new hands-on practical sessions for the course 'Reproduction and Development' were implemented. In previous years, practicals had been divided into two sessions, for the study of the male and female reproductive tracts, respectively. Each session consisted on a 1-hour lecture on the histology of different regions of the reproductive tract followed by students observing histological preparations under the optical microscope. Evaluation consisted on student identifying the organ to which some unlabelled preparations belonged. This year, the first session was carried out as normal. A 30-question survey conducted after this practical evidenced a lack of engagement in the module, together with the feeling that the practicals did not aid in the comprehension of the class lectures; only 35.48% of students obtained a 5.0 or above grade in the questionnaire evaluating elements taught in the practical session. For the second practical, a hand-on method was implemented using reproductive tracts from sows, collected by the teacher from a commercial abattoir (Costa Brava Foods, Girona). Three students were allocated per tract, and tasked with the dissection and observation of the different regions. Students had to aspirate the ovarian follicles to recover the oocytes, and then artificially inseminate them with boar semen that was left over from experiments carried out in a lab in our research group. As a first observation, students were more inquisitive and were more engaged in the practical than previously. When tasked with answering a 30-test questionnaire on the concepts learned in the session, all of the students (31) obtained a passing grade, with 45.16% answering all questions correctly. These results evidenced the improvement of students' knowledge on the anatomy of reproductive tract.

Keywords: Hands-on practicals; Students engagement

QUESTIONNAIRE SURVEY OF ONE WORLD, ONE HEALTH CONCEPT AMONG VETERINARY STUDENTS

Lorena Franco-Martínez, Silvia Martínez-Subiela, Alberto Muñoz, Luis Jesús Bernal, Jose Cerón, Asta Tvarijonaviciute

Interdisciplinary Laboratory of Clinical Analysis Interlab-UMU, Regional Campus of International Excellence Mare Nostrum, University of Murcia, Espinardo, Murcia 30100, Spain

BACKGROUND: The "One World, One Health" (OH) is based on the already-known global context in which humans, animals and the environment are highly interconnected. OH can be defined as the added value in terms of health of humans and animals, financial savings, and environmental services arising from a closer cooperation of human and animal health and other related sectors. Although the benefits of implementing OH are widely known, the OH-based application in the future requires its knowledge from our future professionals.

METHODS: A general overview of the knowledge of the OH concept of thirty second-year veterinary students (eight males and 22 females, aged [median ± standard deviation] 19 ± 0.88) from the University of Murcia was evaluated by the complementation of online surveys.

RESULTS: The 87% of the participants knew about the OH concept, most of them heard it in class (70%) followed by general media (26%) and scientific literature (4%). The own level of knowledge about OH was evaluated as very poor by 40%, and poor by 46%. Most students agreed that human health (30/30), animal health (30/30), food availability and security (27/30), research (30/30) and the environment (29/30) were important or very important fields of OH. However, other topics such as economy (17/30) and legislation (23/30) were considered as less relevant. All the students agreed in the usefulness of OH, and they considered that more information regarding OH should be provided in their official studies (87%) and general media (97%).

CONCLUSION: Most of the participant knew the existence of OH, although 86% considered having poor knowledge about it. Thus, although knowledge of the last year students about OH should be assessed, the obtained data indicate that OH concept should be included or at least reinforced in the curricula of veterinary studies.

Keywords: Education; One World, One Health, Surveys, Veterinary Students

USE OF BIOMARKERS IN SALIVA TO EVALUATE STRESS IN VETERINARY STUDENTS: A GENERAL OVERVIEW

María Dolores Contreras-Aguilar[1], M. J. García-Rubio[2], L. Espín[3], J. P. Navarro Sánchez[3], G. Torrente[4], D. Escribano[5], F. Tecles[1], J. M. Martínez-Selva[3], M.D. Ayala-Florenciano[6], O. Lopez-Albors[6], J.J. Cerón[1]

[1]Interdisciplinary Laboratory of Clinical Analysis (Interlab-UMU), Veterinary School, Campus of Excellence Mare Nostrum, University of Murcia.
[2]Area of basic psychology, International University of Valencia.
[3]Department of Human Anatomy and Psychobiology. Faculty of Psychology, University of Murcia
[4]Department of. Psiquiatría Y psicología Social, Faculty of Psychology, University of Murcia
[5]Department of Food and Animal Science, School of veterinary medicine, Autonomous University of Barcelona
[6]Dept Anat & Comparat Pathol, Veterinary School, Campus of Excellence Mare Nostrum, University of Murcia

Students whose careers are related to health sciences (especially veterinary students) reported higher stress levels during their studies. However, to the authors' knowledge, there are no reports that explore the stress level in veterinary students and compare it with other university students within the health sciences context. Therefore, we aimed to evaluate the stress level of veterinary students from University of Murcia and compare this stress with a different course such as Psychology that seems to produce less degree of stress in their students. In this abstract the overall idea of the project will be presented and some preliminary data will be discussed.

In order to evaluate stress, (a) different psychological questionnaires, e.g. state and trait anxiety, perceived stress, depression, and level of academic engagement (subscale academic dedication, absorption and vigor), were performed; following previous reports (1,2) and also (b) saliva samples 30 min after awakening in two consecutive days were obtained to measure salivary alpha-amylase as a marker of the Adrenergic Nervous System (ANS) and salivary cortisol as a marker of the hypothalamic-pituitary-adrenal (HPA) axis (3,4).

Of the 90 and 190 students from the course of veterinary and psychology, respectively, 46 (51%) and 94 students (49%) voluntarily agreed to participate in the study. Of these, the data of two veterinary students (4% from the participants, 2% from the total) and five psychology students (5% from the participants, 3% from the total) were lost since the sample of saliva were not received the second day of sampling, or because its measurement was not possible (highly mucosa).

Taking into account the voluntary nature of the study, the high participation obtained in this primary experience with university students from the first course opens an opportunity to perform future studies which characterize the anxiety or depression states of these population in order to improve educational systems.

Keywords: Academic evaluation; University students; Salivary assessment.

References

1. Langebæk R, Eika B, Tanggaard L, Jensen AL, Berendt M. Anxiety in Veterinary Surgical Students: A Qualitative Study. Journal of Veterinary Medical Education. 2012;39(4):331–40.
2. Hafen M, Reisbig AMJ, White MB, Rush BR. The first-year veterinary student and mental health: the role of common stressors. Journal of Veterinary Medical Education. 2008;35(1):102–9.
3. Preuss D, Schoofs D, Schlotz W, Wolf OT. The stressed student: influence of written examinations and oral presentations on salivary cortisol concentrations in university students. Stress (Amsterdam, Netherlands). 2010;13(3):221–9.
4. Nagel C, Ille N, Erber R, Aurich C, Aurich J. Stress Response of Veterinary Students to Gynaecological Examination of Horse Mares - Effects of Simulator-Based and Animal-Based Training. Reproduction in domestic animals = Zuchthygiene. 2015;50(5):866–71.

VIRTUAL MICROSCOPY AS A TEACHING TOOL IN HISTOLOGY TRAINING

Fernando Capela e Silva[1], Luis Miguel Rato[2], Orlando Silva Lopes[3]

[1]Departamento de Biologia, Escola de Ciências e Tecnologias e Instituto de Ciências Agrárias e Ambientais Mediterrânicas (ICAAM), Universidade de Évora, Portugal. E-mail: fcs@uevora.pt

[2]Departamento de Informática, Escola de Ciências e Tecnologias e Centro de Inovação em Tecnologias da Informação (CITI), Universidade de Évora, Portugal. E-mail: lmr@uevora.pt

[3]Departamento de Biologia, Escola de Ciências e Tecnologias e Instituto de Ciências Agrárias e Ambientais Mediterrânicas (ICAAM), Universidade de Évora, Portugal. E-mail: osl@uevora.pt

Histology's traditional teaching is characterized by using the photonic microscope and observing histological slides. This requires the use of a large number of microscopes in the classroom and a wide range of histological slides using both routine and specific techniques, such as histochemistry and immunohistochemistry, from different organs spanning different veterinary species by which normal and pathological situations may be examined. However, the high costs that the traditional teaching method entails have led to an alternative and increasing use of virtual images taken from histological slides (1,2). Besides reducing financial costs, this approach offers the possibility to overcome ethical issues and legal restrictions on the use of animals and animal tissues at different levels of education (2).

According to Rocha et al (3) a digital slide system for public web access is composed of 3 components: a digital slide acquisition system that acquires the images, a digital slide server that makes the acquired images available on the web, and finally a digital slide client that enables the user to browse the digitals slide. However, the creation of virtual microscopy image files requires quality histological slides, sometimes costly (3), and, in some cases, the use of high-cost scanner and mass data storage devices are necessary, resources that are not always available in all educational institutions (4). To overcome these problems, the Virtual Microscopy Database (VMD) was created, a virtual image file-sharing website that allows researchers and educators easy access to a large repository of virtual histological and pathological images, which currently is organized in institutional collections from 15 USA universities (4). VMD users can upload their own collection of virtual slide files as well as view and download image files for research and nonprofit education purposes that have been deposited by other users of this VMD database (4).

The present work aims to create a database in the field of animal histology, among several European educational institutions, to widen the free access to an array of virtual slides covering different tissues, organs, animal species, pathologies, and staining techniques.

Keywords: Histology, Teaching, Learning, Virtual Microscopy

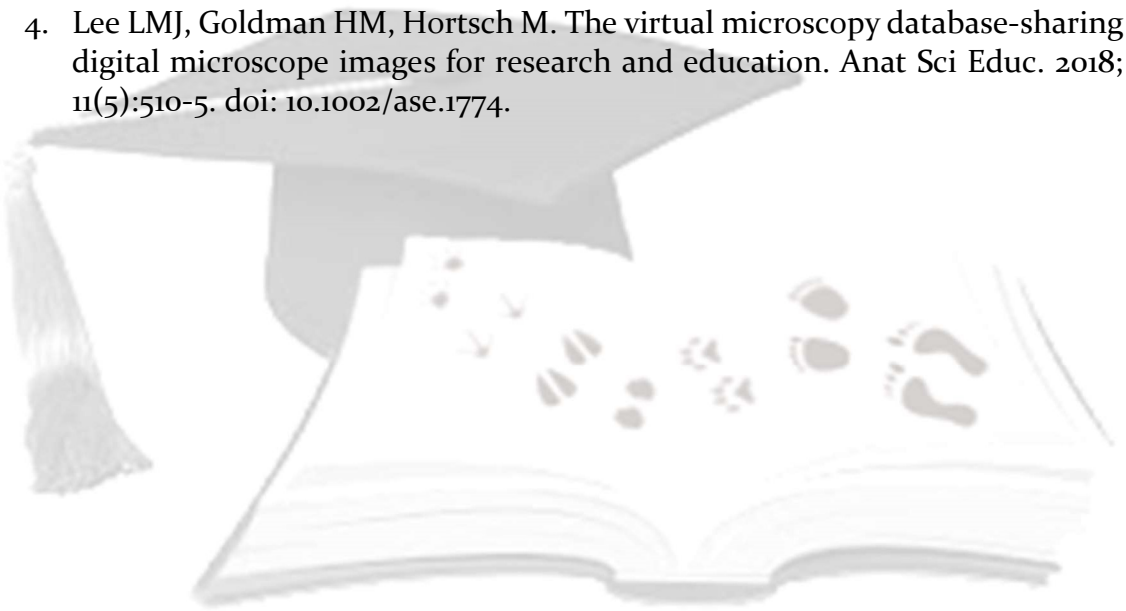
References

1. Dee FR. Virtual microscopy in pathology education. Hum Pathol. 2009 40(8):1112-21. doi: 10.1016/j.humpath.2009.04.010.

2. Lewis DI. The pedagogical benefits and pitfalls of virtual tools for teaching and learning laboratory practices in the Biological Sciences. The Higher Eduction Academy, UK, 2014. 30 p. (available at https://www.heacademy.ac.uk/system/files/resources/the_pedagogical_benefits_and_pitfalls_of_virtual_tools_for_teaching_and_learning_laboratory_practices_in_the_biological_sciences.pdf)

3. Rocha R, Vassallo J, Soares F, Miller K, Gobbi H. Digital slides: present status of a tool for consultation, teaching, and quality control in pathology. Pathol Res Pract. 2009; 205(11):735-41. doi: 10.1016/j.prp.2009.05.004.

4. Lee LMJ, Goldman HM, Hortsch M. The virtual microscopy database-sharing digital microscope images for research and education. Anat Sci Educ. 2018; 11(5):510-5. doi: 10.1002/ase.1774.



EMPLOYMENT OF INTERACTIVE WHITEBOARD AND REAL-TIME PROJECTION OF SURGERIES IN THE THEORETICAL-PRACTICAL TEACHING OF MASTER STUDENTS IN THE SMALL ANIMAL CLINIC OF THE UNIVERSITY OF MURCIA

Juana D. Carrillo, María T. Escobar, Asta Tvarijonaviciute, José Murciano.

Departament of Animal Medicine and Surgery. University of Murcia. Spain.

The interactive whiteboard is a large touch-sensitive monitor, which emerged as a very useful technological innovation for teaching. Its basic functions include: move, show, hide, highlight, animate, retrieve objects or texts, which allows a more interactive, stimulating presentation and increases the participation of students, allowing collaborative tasks. On the other hand, it is known the great utility of the projection of videos in the delivery of practical classes. If the projection is shown at the same time the surgery is being performed in real time in the surgery room, the teacher can explain each one of the steps that are being carried out in this intervention, supporting their explanation on the interactive whiteboard. This supposes a great advance in the veterinary education, in which formerly it was limited to the presence of the students in the operating room, where they could hardly see in detail the development of the surgical technique in the patient.

Currently it is unfeasible to think that a teacher is limited to only give a master class, especially when the class has a theoretical and a practical nature as the subject Soft Tissue Surgery, Traumatology and Orthopedics given in the Master in Small Animal Clinics. Although the voice and the oral expression are the first teaching resources that teachers have and beyond the classical material resources (books, PDF, etc), today there is a wide range of resources available to communicate and transmit knowledge.

The objective of this work is to share the experience of the authors in the use of interactive whiteboards. The projections explained in real time of surgical interventions are available to students in the theoretical-practical classes of Soft Tissue Surgery, Traumatology and Orthopedics in the University Master that we developed in our center.

Keywords: real-time projection; interactive whiteboards; university master

FROM IDEA TO PRACTICE: A LOW-TECH MODEL TO TRAIN SMALL ANIMALS OBSTETRIC SKILLS

Rita Payan Carreira

Departamento de Medicina Veterinária, Escola de Ciências e Tecnologias e Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Portugal. E-mail: rtpayan@uevora.pt

The use of models in learning technical competencies in health sciences, and particularly in Veterinary Medicine (VM) targets two main goals: 1/ to train students into particular scenarios; 2/ reduce the number of practices using animals to train invasive techniques/procedures; and 3/ allow students to acquire some basic technical skills before applying them with living animals. In some particular situations, they also allow overcoming the dependency of a considerable case-load. This issue is particularly relevant in the obstetrics field when approaching dystocia.

Within the obstetrics syllabus/course, students need to learn how to access dystocia and determine the fetus position in the birth canal. However, it is not always possible to gather the cases at the correct timing to meet the objectives of the course, nor it is always possible to allow all the students to perform the needed procedures during a clinical situation, on behalf of the female wellbeing face to ratios of students per group. Therefore, the use of models/simulators is foreseen either to compensate for the low availability of patients and standardize procedural skills acquisition. However, commercial models, when available, are often rather expensive. However, teachers, based on their professional/technical experience, may design alternative models.

This work intends to present the development of a low-tech, median-reality simulation model developed to support the development of clinical skills (including tactile, spatial, situational, and emotional skills) in students of the Veterinary Medicine program at the University of Évora in the academic year of 2018/19. It shows that it is possible to design models with cheap and easily accessible supplies having a moderate resemblance to real animals/situations. Low-tech models are useful educational tools in preparation for live animal manipulations and may further entrust students´ autonomy and smooth the translation of skills from models to live animal.

Keywords: Veterinary Medicine, Training, Skills acquisition

THE RISE OF NON-CONVENTIONAL THERAPIES IN VETERINARY PRACTICE - A FAILURE IN THE EDUCATION OF VETERINARY STUDENTS?

Manuel Magalhães-Sant'Ana[1,2], Nuno H. Franco[3,4]

[1.] CIISA, Faculdade de Medicina Veterinária, Universidade de Lisboa, Lisboa, Portugal

[2] Ordem dos Médicos Veterinários, Lisboa, Portugal

[3] IBMC - Instituto de Biologia Molecular e Celular, Universidade do Porto

[4] i3S - Instituto de Investigação e Inovação em Saúde, Universidade do Porto

In recent years, non-conventional therapies (NCTs) – such as Acupuncture, Traditional Chinese Medicine, Homeopathy and Osteopathy – have become increasing popular in veterinary practice. These, however, lack scientific grounding and the fallacies and historical misconceptions used to justify such therapies have been thoroughly exposed (1–3). The popularity of NCTs among veterinarians is therefore hard to understand, especially considering the progress made possible by evidence-based veterinary medicine (4), which since its inception in the early twentieth century has had a crucial role in the increasing quality of animal healthcare and food safety.

We thus tentatively propose that this phenomenon may result from a) failure to teach the merits of evidence-based veterinary medicine and b) NCTs being taught as legitimate therapeutic options to veterinary students.

This talk will cover an initial attempt to comprehensively map how NCTs are currently being conveyed to veterinary students and practitioners in Portugal. We carried out a key-word search of resources provided by the six Portuguese veterinary schools, and reviewed undergraduate curricular units, post-graduate/professional courses and Master theses relating to Non-Conventional Therapies.

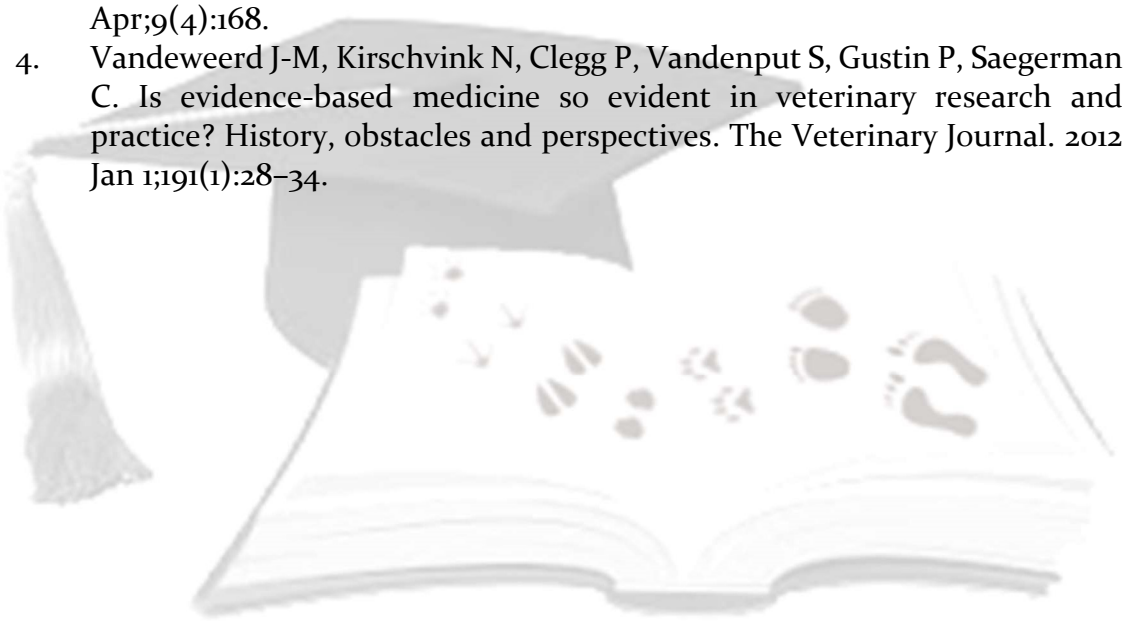
Results show that NCTs can be found in all Portuguese veterinary schools, either as part of educational programmes (elective curricular subjects and post-graduate/professional courses) or as subject of Master theses, with acupuncture being the most represented therapy. Conversely, little information exists regarding explicit teaching of evidence-based veterinary medicine. This possible educational bias towards scientifically unproven or epistemologically implausible therapies has the potential to endanger animal health and welfare, and damage the reputation of the veterinary profession.

We will explore the implications of these results and suggest possible opportunities for improvement. In addition to revising the undergraduate veterinary curricula, safeguarding the role of the veterinary profession requires a combination of pedagogical approaches, including continuing education opportunities in science-based medicine, history of veterinary medicine and critical thinking.

Keywords: Science-based medicine, curriculum, alternative medicines, veterinary medicine

References

1. Gough A, Taylor N. No Way to Treat a Friend: Lifting the Lid on Complementary and Alternative Veterinary Medicine. 1 edition. Portland: 5m Publishing; 2017. 400 p.
2. Magalhães-Sant'Ana M. Sobre Unicórnios e Meridianos: Uma análise crítica à Medicina Veterinária Tradicional Chinesa [Internet]. Scimed. 2018 [cited 2018 Jul 3]. Available from: https://www.scimed.pt/geral/sobre-unicornios-e-meridianos-uma-analise-critica-a-medicina-veterinaria-tradicional-chinesa/
3. Magalhães-Sant'Ana M. The Emperor's New Clothes—An Epistemological Critique of Traditional Chinese Veterinary Acupuncture. Animals. 2019 Apr;9(4):168.
4. Vandeweerd J-M, Kirschvink N, Clegg P, Vandenput S, Gustin P, Saegerman C. Is evidence-based medicine so evident in veterinary research and practice? History, obstacles and perspectives. The Veterinary Journal. 2012 Jan 1;191(1):28–34.



ACADEMIC RESEARCH ON CATTLE'S ACCLIMATISATION PROCESS

Flávio Silva[1], Cristina Conceição[1,2], Liliana Cachucho[3], Catarina Matos[1], Ana Lúcia Garrido[1], Ana Geraldo[1,2], Elsa Lamy[2], Fernando Capela e Silva[2,4], Paulo Infante[5] & Alfredo Pereira[1,2]

[1]Departamento de Zootecnia, Universidade de Évora, Portugal;
[2]ICAAM, Universidade de Évora, Portugal;
[3]CEBAL, Beja, Portugal;
[4]Departamento de Biologia, Universidade de Évora, Portugal;
[5]Deparatamento de Matemática, Universidade de Évora, Portugal.

Animal's welfare and performance is compromised by environmental heat stress, present during summer in the Mediterranean climate. Heat stress effects are well known and widely studied, although the mechanisms of season acclimatisation are less well understood. Throughout the last 20 years, we have been studying this process in the Mediterranean and tropical regions, aiming to understand it better, developing and improving methodologies and search for reliable biomarkers of thermal stress.

The climatic changes, the more frequent extreme events and the increase of ambient temperature at the surface of the earth were identified as a problem to the animals in general and particularly under production systems conditions. Then, the main question is how those factors can affect the farm animals, especially those with higher genetic merit for production and lack of environmental adaptation. With these premises, were developed research projects on cattle's acclimatisation process. These projects outcomes were: 2 PhD thesis and 5 Master dissertations, alongside ten articles peer-review and index journals and 20 publications in the book of abstracts and also several communications in national and international symposiums.

Keywords: acclimatisation; heat stress; cattle.

UNIVERSIDADE DE ÉVORA
ESCOLA DE CIÊNCIAS E TECNOLOGIA

UNIÃO EUROPEIA

Fundo Europeu
de Desenvolvimento Regional

I International Congress of Education in Animal Sciences (ICEAS)
June 7, 2019 - Évora
ISBN: 978-84-09-12019-2