LAS-Learning

Course Organisers Instructions

EU Module 9 - Ethics, Animal Welfare and the Three Rs - Level 2

Development of interactive e-learning modules on specific areas of the Education & Training framework facilitating the implementation of DIR 2010/63/EU

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Suported by:

Partners:

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1. Module Description

a. Overview

This module - Ethics, Animal Welfare, and the Three Rs, level 2 - explores the ethical considerations and the Three Rs concerning animal use. We look at various perspectives on animal science within Europe and globally. The module discusses the connections between ethics, the Three Rs, and the scientific validity and applicability of research results. Legal and policy constraints on animal research are also addressed. We will examine the harm-benefit analysis tool in detail. Furthermore, we will highlight the importance of transparency and dialogue when communicating with the general public, including using non-technical summaries.

This document provides guidance and suggestions to support the course organiser's efforts. Each module is aligned with the learning outcomes outlined in the EU Education & Training framework for laboratory animal science.

We recommend consulting the EC Training and Education framework guidance document if you are accessing the site independently. This resource offers an overview of training requirements for individuals with different responsibilities under their relevant national legislation.

Further reading and additional education and training may be necessary to meet national or institutional training requirements. At the end of each module, you will find a list of recommended further readings and references cited throughout the content. Links to these references are provided whenever possible.

This module was developed by Anna Olsson and Paulin Jirkof, two renowned experts with extensive experience in animal welfare, animal ethics, and the Three Rs. Their work spans research, publications, and training in these fields. The module was further revised by an international Reflection Group panel, with coordination led by Nuno H. Franco.

The module is currently in the testing phase. We appreciate your collaboration in integrating it into your courses and providing feedback. After completing a module, please fill out the form below with your feedback.

b. Learning Objectives

This module will equip participants with essential knowledge and skills to navigate animal research's ethical, legal, and practical aspects. The key learning objectives include:

1. Different views on animal experimentation.
2. Science and the Three Rs.
3. Legislation and Ethics.
4. Project review and harm-benefit analysis.
5. Dissemination and dialogue.

2. Course Program

The module is organised into different chapters, with lessons and learning objectives for the participants as follows:

Chapter	Lesson	Learning objectives
Introduction	1	Get to know the learning objectives
Different views on animal experimentation	2-6	Explain the importance of studying public opinion and the factors affecting public acceptance Discuss how animal experimentation has been criticised for almost as long as it has existed Discuss "From the first EU legislation to Directive 2010/63/EU" Understanding the dilemma of using animals in experiments in the light of ethical theories Assess your knowledge
Science and the Three Rs	7-9	Explain the challenges of translation and validity of animal research in science Describe the Three Vs of validity in animal research Describe the Three Rs in Europe
Legislation and ethics	10-12	Discuss the limits to research in Directive 2010/63/EU Describe the National initiatives and Institutional limits Self-reflection on Directive 2010/63/EU and ethics: limits from a personal and professional perspective
Project review and harm-benefit analysis	13-15	Explain the project review in a legal and historical context Describe the 4 more general points on how to perform the project evaluation Discuss project review and harm-benefit analysis; whom, when and how?
Dissemination and dialogue	16-18	Discussion "Do scientists have to engage in dialogue?" Describe Non-technical summaries (NTS) and auto-assess them for being understandable to a non-scientist Describe and discuss "Critical discussion of cases: Scientist to scientist communication"
Summary and knowledge check	19-21	Module summary List of references and further reading Assess your knowledge

Table 1 - Learning objectives per parts and lessons.

a. Progress Tracking

Once learners begin working through a module, their progress is automatically tracked. This allows them to pause and resume their studies at any point. Upon completing the module, learners retain access to all sections, enabling them to revisit and review specific topics to reinforce their understanding.

b. Model Structure and Implementation Guidance

The module is structured into several parts, which were designed to be followed in sequence but can also be taken iteratively based on the learner's needs. Please note that a **certificate of completion** is issued exclusively to learners who finish all parts of the module.

From a pedagogical perspective, each tutor is responsible for deciding which materials to use in face-to-face sessions, which parts learners should complete independently, and whether to mandate their completion. However, it is essential to consider the time required to complete the eModule or its parts to avoid overburdening learners.

We highly recommend completing the module to ensure it aligns with your course's content and scope. Familiarising yourself with the material will also enable you to engage more effectively with students on the various topics covered in the eModule.

c. In-Depth Explanation Lesson by Lesson

Lesson	Title	LO	Explanation
1	Introduction		Image and tagline.
2	Public opinion and animal research	9.1	Image and short introduction Eurobarometers measure the attitude of Europeans illustrated with a diagram and description. Factors affecting public acceptance represented with 2 flip-cards. Geographic and cultural diversity represented with text and bar charts
3	Experiments and antivivisection - a historical perspective	9.1	References to important books and campaigns represented with text and images. Example of protests and legal actions illustrated with 1 image and 1 book quote.
4	The animal research dilemma in contemporary Europe	9.1	Description of the first EU legislation to Directive 2010/63/EU illustrated with one image. Differences between Campaigns and public opinion
5	Understanding the dilemma in the light of ethical theories	9.1	Introduction to the debate about the rights and wrongs of animal experimentation illustrated with 2 images. Contractarianism represented with descriptions and 5 quotes. Animal rights view represented with 1 image,1 quote and 2 flip-cards.
6	Knowledge-check		Assesses your knowledge
7	The challenges of translation	9.2	Translation and validity of animal research represented with one image, 2 flip-cards, 2 images of articles,

			Observations of experimentalists illustrated with lists and a 3 tile collapsible.
8	The Three Vs of validity in animal research	9.2	The 3Vs of validity represented with 1 image, 1 matching quiz and 3 flip-cards. Validity of animal models represented with a timeline and 3 flip-cards. List of questions to think about validity. Experimental design and practice description represented with 1 image and a 3-tile collapsible. Assessing the impact of good experimental practice and quantifying the impact of human bias represented with one diagram and 1 table. Valid experiments require valid design represented with one vídeo, 2 flip-cards, 2 diagrams and 1 photo. Non-interactive exercise represented with 2 lists and one diagram.
9	The Three Rs infrastructure in Europe	9.2	Description represented with 3 flip-cards, 1 image of 2 bar charts and 1 diagram. Newly established centers represented with 2 images and 1 chart. 3Rs Centres in Europe represented with 1 photo and 3 lists. Producing and synthesising knowledge to move the field forward represented with 2 lists and 4 images.
10	Limits to research in Directive 2010/63/EU	9.3	Different types of limits are described with 1 diagram, 1 list and a 4-tile collapsible. Sentience and legislation description represented with 1 list, 1 video, a 4 tile collapsible and a 2 window tab. Limits for research on great apes represented with 5 images and 1 list.
11	National and institutional limits	9.3	A level playing field within the EU description with an image. National initiatives description represented with 3 images. Institutional limits description represented with a list.
12	Directive 2010/63/EU and ethics: self-reflection	9.3	Reflecting further on limits represented with 1 collapsable, 1 short answer quiz and 1 multiple choice quiz.
13	Harm-benefit analysis: principles and methods	9.4 9.5	Project review in a legal and historical context, description with 1 image. Terminology description What should the project evaluation do? represented with 2 lists.
14	Harms and benefits - what are they?	9.4 9.5	Project review in practice represented with 3 lists.

			How to perform the evaluation? Represented with 4 lists, 1 image and one slack of 3 flip-cards. Severity classification represented with 1 list and 1 image. Important questions to ask, represented with 1 quote. Aspects to consider in project evaluation represented with 3 lists, 1 image, 1 vídeo and 1 diagram. Consider benefit and harm represented with 1 image, 2 lists and 2 tables. Cases descriptions for primates, mice and dogs, represented with a 10 window process and 1 table each.
15	By whom, when and how? Challenges.	9.4 9.5	Project review and harm-benefit analysis represented with 3 quotes. Different types of expertise represented with 5 lists, 1 photo and 1 interactive labelled graph.
16	Science with and for society: transparency and dialogue	9.6 9.7	Scientists engaging in dialogue represented with 1 image, 1 multiple choice quiz and 1 quote. Science in society, represented with 3 images, 1 interactive scenario and 1 bar chart.
17	Non-technical summaries	9.6 9.7	NTS – from researchers to the lay public represented with 3 flip-cards, 1 image and 1 list. How to write a non-technical summary represented with 1 list, 1 process with 6 windows and 1 citation. Exercise about translating academic writing with 2 short answer quizzes.
18	Critical discussion of cases	9.6 9.7	Scientist-to-scientist communication represented with 3 images and 2 multiple choice quizzes. The ARRIVE guidelines represented with 1 image, 1 process with 10 windows, and 2 lists.
19	Summary		Module summary
20	References and Further Reading		References for additional materials
21	Knowledge-check		Assesses progress and knowledge acquired during the module

Table 2 - Explanation lesson by lesson.

3. Participants' Profile

This module is designed for a broad and diverse audience, including (bio)medical researchers, participants in laboratory animal science courses, university students, biology and medical educators, animal welfare body members, regulators, and anyone seeking a more in-depth understanding of animal research ethics and the principles of Replacement, Reduction, and Refinement (the Three Rs) in scientific and educational settings.

The topics of Ethics, Animal Welfare, and the Three Rs are introduced at a foundational level in Module EU-2. Module EU-9, however, delves deeper into these concepts and is better suited for individuals with prior knowledge or experience in the field. While both modules can be taken independently, we strongly recommend starting with Module EU-2 and progressing to Module EU-9 to build a more comprehensive and nuanced understanding of these critical subjects. This structured approach will help participants gain deeper insights into ethical research practices, animal welfare, and the practical implementation of the Three Rs.

Participants are likely to benefit from prior familiarity with bibliographic database searches and an essential background in laboratory animal science or non-animal methods. Course organisers should consider this when designing the course structure and preparing support materials to ensure a practical and engaging learning experience.

4. eModule

The eModule provides clear definitions, essential knowledge, and interactive components designed to enhance understanding of key animal ethics theories and develop critical thinking skills. Participants will learn to ethically frame and evaluate animal research from a broad perspective and a case-by-case approach.

The content and references are curated from expert sources, including researchers and information specialists, ensuring high-quality and reliable information. The module is presented dynamically, combining text, images, built-in exercises, and videos to engage learners effectively. It can be integrated into courses as homework or used during a lecture day. Many lessons are designed to deliver comprehensive information and understanding without additional in-class interaction.

a. Limitations

It is impossible to cover every concrete example of animal use for scientific and educational purposes. Additionally, the module cannot address how to establish a Culture of Care in the specific context of every institution or organisation. Furthermore, the module cannot predict future scientific advancements that may expand the Three Rs possibilities nor anticipate societal or regulatory changes after publication. Despite these limitations, we hope this module will equip students with the skills and knowledge to adapt to an ever-evolving scientific, societal, and regulatory landscape.

b. Blended Learning Approach

E-learning modules offer significant advantages, particularly for learners who may find it challenging to attend traditional intensive training sessions spanning several days. Such sessions can disrupt work schedules and limit participants' ability to balance learning with other responsibilities. While this eModule covers all required learning outcomes, we do not advocate entirely replacing face-to-face teaching (or "live" online discussion sessions) with e-learning. Instead, we recommend a blended learning approach (hybrid or mixed-mode learning). This approach combines the flexibility of e-learning with the engagement of interactive, live sessions, ensuring that learners receive the necessary information while accommodating those who require greater flexibility.

The modules are split into short, manageable lessons, allowing participants to integrate learning activities into their daily schedules seamlessly.

5.Implementing Blended Learning Strategies

Flipped Classroom Arrangement

Before face-to-face classes, learners are introduced to the course contents (for example, by completing our e-learning modules). You can recommend that learners take the whole course (and request a certificate of completion) or focus on specific lessons or chapters.

This approach can:

- Familiarise learners with the content in advance, helping them better understand complex concepts.
- Prepare and motivate learners to engage more actively in their learning and during face-to-face classes.
- Harmonise learners' knowledge levels before in-person classes.
- Provide sufficient background knowledge for group work, allowing for more focused and productive discussions.
- Provide a starting point for interactive discussion.

Consolidate Learning and Prepare for Exams

The courses are designed to align with the learning outcomes of traditional laboratory animal science courses. Learners can use each module to study and prepare for the final exam. Additionally, the built-in quizzes allow learners to test their knowledge and track their progress.

Address Expertise Gaps in Your Facility

Gathering expertise across all subjects covered in the EU-functions modules can be challenging, especially in smaller establishments. This may hinder the ability to deliver training that meets all outcomes of the Education and Training framework to a high standard. Using these modules as a basis, tutors and learners can access quality reference material that could mitigate such gaps and ensure education and training are up to standard.

Use Modules as Teaching Resources

Tutors can integrate various components—such as text, videos, images, interactive exercises, and quizzes—into their teaching activities. This not only boosts engagement but also caters to different learning styles. For each module, we provide suggestions for topics that can be incorporated into interactive discussion sessions.

6. Textbooks and Reading Materials

The **"References and Further Reading"** lesson provides most references and readings. They comprise scientific articles, sections of books, websites, and videos. Clicking on any link will open a new window to download or visualise the additional material. Several links to further resources can also be found in the module contents to better guide the reader.

The additional materials provide more information on specific topics, tools, and resources. They are ideal for learners who wish to expand their knowledge or gain a more comprehensive understanding of the issues.