



ECS

European Cetacean Society

[Home »](#)

Evaluating an interactive 3D web-based learning tool to improve the understanding of ovarian transformations in long-finned pilot whales among marine veterinary professionals

Primary author first name: Thitiorn

Primary author last name: Ussavarangsi

Primary Author Affiliation: MSc Medical Visualisation & Human Anatomy 2025, The Glasgow School of Art & University of Glasgow

Additional authors:

First name: Dr. Matthieu

Last name: Poyade

Affiliation: School of Innovation & Technology, The Glasgow School of Art, G3 6RQ, UK

First name: Mariel

Last name: T.I. ten Doeschate

Affiliation:

Scottish Marine Animal Stranding Scheme School of Biodiversity, One Health and Veterinary Medicine College of Medical, Veterinary and Life Sciences, University of Glasgow, G12 8QQ, UK

First name: Dr. Andrew

Last name: Brownlow

Affiliation:

Scottish Marine Animal Stranding Scheme School of Biodiversity, One Health and Veterinary Medicine College of Medical, Veterinary and Life Sciences, University of Glasgow, G12 8QQ, UK

Abstract body

Understanding ovarian anatomy and transitions between reproductive states is essential for interpreting female life history in cetaceans. Yet, research is constrained by limited specimen access and reliance on conventional methods such as histology and static images, which reduce three-dimensional complexity to two-dimension representations. This study presents and evaluates an interactive WebGL-based 3D learning platform which allows visualizing ovarian structural transformations in long-finned pilot whales (LFPW) (*Globicephala melas*), with the goal of improving anatomical understanding among professionals and exploring MRI as a more comprehensive imaging technique for assessing female reproductive tissues and status.

Ovarian structures from five stranded female LFPW specimens provided by the Scottish Marine Animal Stranding Scheme (SMASS) were digitally reconstructed from MRI data, using volumetric and 3D modelling software, and imported into a bespoke online interactive platform. The platform enables visualizing ovarian anatomy across two reproductive stages: sexually active adult and postpartum. Evaluations involved veterinary professionals, marine mammal researchers, and related specialists internationally (n = 22), using five metrics: knowledge gain (pre/post-test), cognitive load, face and content validity, usability (SUS), and user motivation (RIMMS).

Knowledge assessments showed significant improvement ($Z = -2.652$, $p < 0.05$) with reduced score variability, indicating greater consistency in understanding. Cognitive load analysis revealed correlations between extraneous and germane load linked to interface design challenges. Face and content validity indicated favorable perceptions of anatomical accuracy and educational content, though variability highlighted areas for refinement. Usability scored above average (SUS = 75.57 vs. standard 68), and motivation was moderate to high, with confidence and satisfaction rated highest. This research establishes a replicable framework for transforming archived specimens into accessible educational and diagnostic resources, addressing gaps in diagnostic capacity for larger cetacean reproductive tissues. By removing geographical barriers, the web-based platform advances digital visualization techniques, supporting marine mammal science and conservation education globally.

General keywords

Anatomy

Developmental anatomy

Strandings

New technologies/methods

Novel application of existing technology

Taxonomy

Globicephala melas

Preferred presentation type: Poster

Second choice presentation type: Short talk

Language assistance for non-native English speakers: I don't need language assistance

Main Topic: [Emerging topics](#)

Secondary topic: [Anatomy and physiology](#)

I declare that all authors had the opportunity to review the abstract and approved its submission.: Yes

While copyright remains with the authors, I declare that I grant the ECS unlimited rights for reproduction in any form: Yes

All necessary licenses and permits have been obtained for the work presented, ensuring full legal compliance with regulations.: Yes

I agree to receive communications about this abstract by email: Yes

Final SC decision: Pending review

Conference Reference: [37th Annual Conference, Dundee, Scotland](#)

[Back to content editing](#)

[Imprint](#)

[Privacy Policy](#)

