



## Facilitating feedback on filter-feeders: integrating technology to improve individual feedback on dichotomous identification keys

**Anna E. McGregor**

513 Graham Kerr Building, University of Glasgow, anna.mcgregor@glasgow.ac.uk

### Project Aims

Accurate identifications are a fundamental skill at all levels in ecology and field research and are typically done with use of a dichotomous key. Teaching this skill at the undergraduate level requires considerable staff time and expertise, which is particularly challenging with large class sizes, and in most cases feedback on correct use of the key is impossible.

The goals of this project were to develop a **dichotomous ID key** for common UK marine invertebrates that runs as an iPad app to 1) improve **student engagement** in the exercise and 2) allow instructors to provide **rapid feedback** on whether completed identifications were correct.

### Methods

Study location: University Marine Biological Station (UMBS), Isle of Cumbrae.

Animals were collected from sandy shores, rocky shores, and near shore benthic & infaunal habitats. Back at the lab, students were asked to identify several animals that were collected using both published keys and the iPad app.



Collecting rocky shore animals

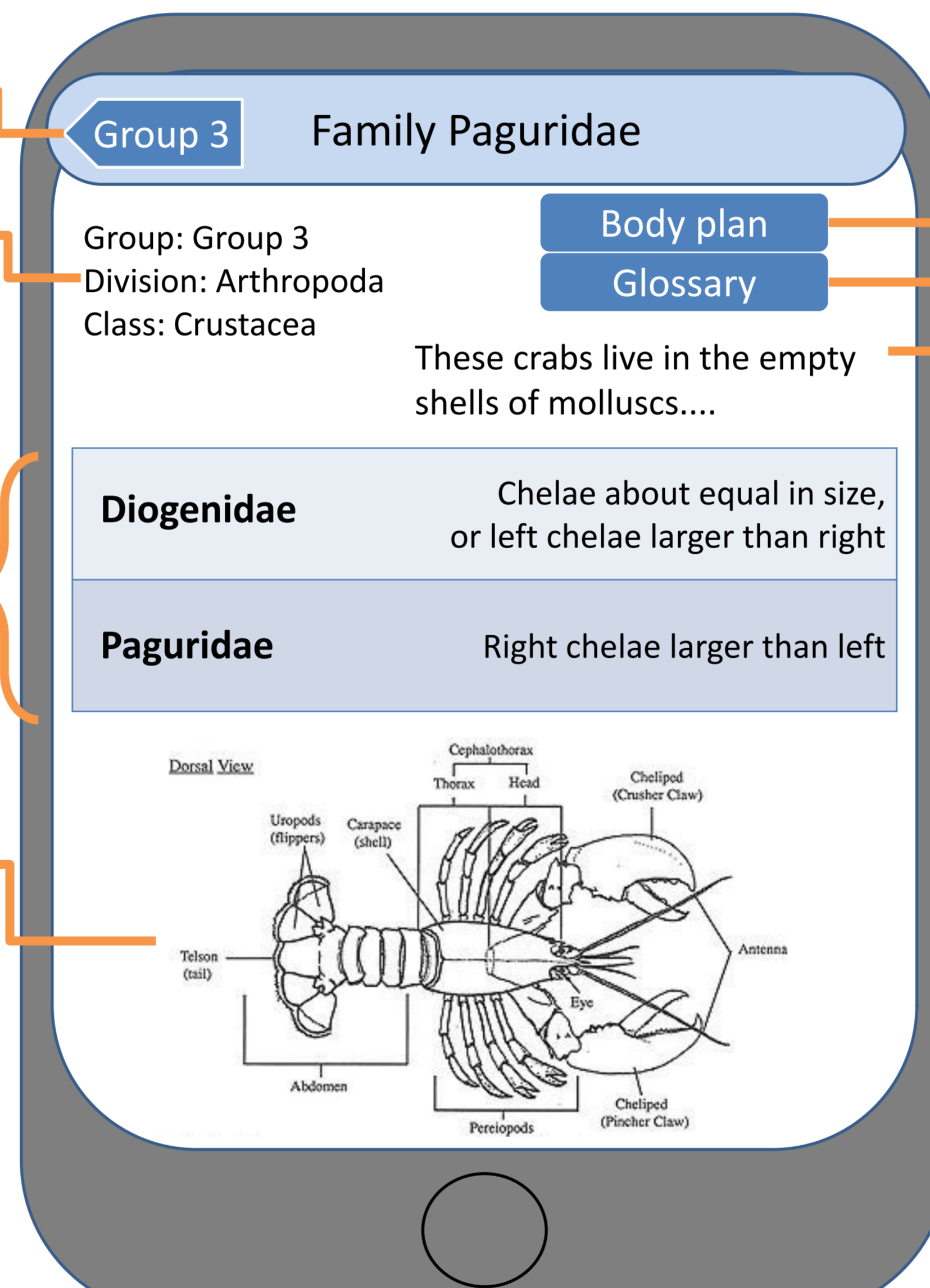


Identifying animals in the lab

To go back to previous level  
'Breadcrumb' trail to track selections

Table where user selects correct trait to narrow down ID to next level

Body plan diagram that appears when button is selected

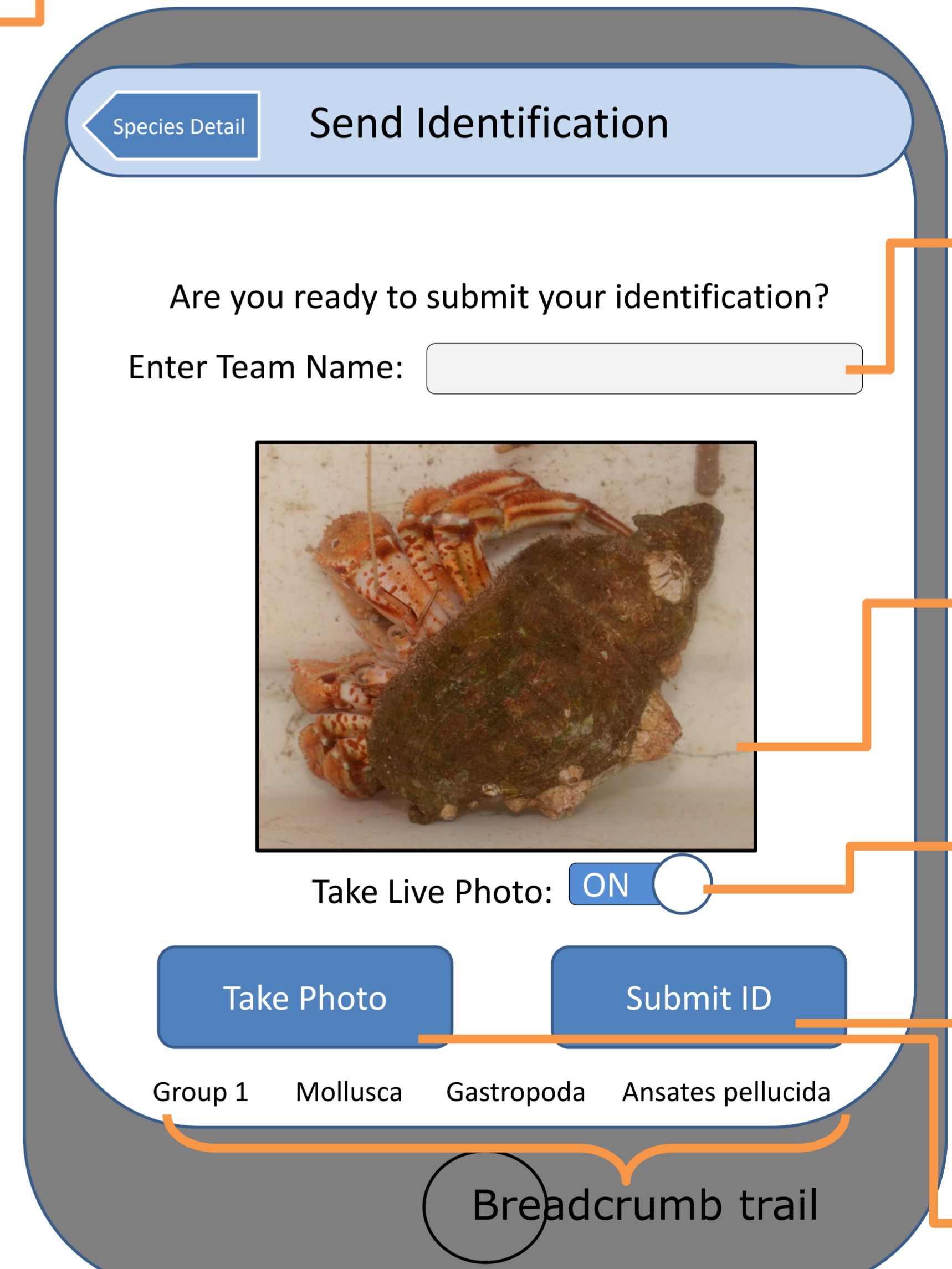


**ID key Screen**  
Presents distinguishing characteristics of specimen in a stepwise manner. Selection of one trait takes user to next most specific taxonomical level, until finally reaching the species identification.  
  
Key from A student's guide to the seashore, 3<sup>rd</sup> edn. (Fish & Fish, eds, 2011. Cambridge University Press) used with permissions

Brings up diagram that shows general body plan with key anatomical features

Brings up pop-up menu with definitions of key terms

Brief description of level



**Final screen**  
Sends email with final ID, breadcrumb trail & photo to instructor

User name will be used as email subject

Image where photo appears

Selects from iPad's library or camera

Sends email

Activates camera

### Reflections

- High potential for engaging students in group work
- Focuses on identification process and circumvents difficulties with terminology
- Avoids just flipping through the book
- Flexible for modification to other animal/plant groups
- Very time-intensive development
- Implementation requires instructor devoted to feedback

### Plans for the future

- Alert notification when feedback is received
- Self-quiz that works through ID for pre-set animals
- More clarifications on sending identification screen
- Better layout for early screens in selection process

**Acknowledgements:** This project has been funded by a Teaching Development Grant from the Higher Education Academy.

Thanks to the UMBS Millport staff (Drs. Philip Cowie, Phil Smith & Claire Guy), the Glasgow Animal Biology teaching staff (Drs. Isabel Coombs, Vic Paterson & Ashley Le Vin), the editor at University of Cambridge Press (Dr. Dominic Lewis), and the 2013 University of Glasgow Zoology 3B students, especially Marek Wolfe.