

[P30] The 'Animal Diversity CD-ROM': developing a multimedia learning resource to support a self-taught undergraduate zoology module

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At the University of Reading the Cole Museum of Zoology provides students studying the BSc. Zoology with a world-class educational opportunity (Trewavas, 1956) and following the Museums recent refurbishment and restoration, it is now used extensively to support undergraduate teaching in zoology.

In response to reports from employers that there is a widening 'skills gap' in the taxonomic skills of zoology and ecology graduates (British Ecological Society, 2004), academics in the School of Biological Sciences have developed a new self-taught, third year undergraduate module in 'Animal Diversity' for students studying zoology. The module is based entirely on the collections held within the Cole Museum of Zoology.

The Animal Diversity module is designed to support the further development of students' taxonomic skills, as well as enhancing their transferable skills and providing them with a unique opportunity to gain experience of working in a museum environment. Assessment of the module requires students to design virtual cases for the Cole Museum, based on taxonomic issues, and to prepare a written and an oral assignment on specific taxonomic groups. There is also a practical examination using specimens from the Cole Museum, which further assesses their taxonomic skills and understanding.

The Animal Diversity CD-ROM

To enhance the Animal Diversity module we have undertaken a collaborative project between the University's Division of Environmental Biology and the Centre for Excellence in Teaching and Learning in Applied Undergraduate Research Skills (CETL-AURS) to create an interactive CD-ROM that serves as an integral learning resource for the Animal Diversity module. The effective use of an interactive CD-ROM in the teaching of zoology and human biology has been reported previously (Coall, 2002).

The Animal Diversity CD-ROM was developed according to a seven stage multimedia development model and was designed according to the latest pedagogical theories (Meyer, 2005) and accessibility information relating to the use of multimedia in higher education. Information derived from student questionnaires was also used to inform the technical and user-interface design process. The first edition of the CD-ROM contains over 1000 individual multimedia pages, 1,100 images, 102 diagrams/graphics and 50 formative learning multiple choice quiz questions.

Pedagogic Design

The CD-ROM is comprised of four main sections, which are each designed to provide a different type of learning support for students studying the Animal Diversity module. For example, the guide to the taxonomy of the animal kingdom, called the 'Taxonomy Explorer', is a supportive hypermedia resource that supports learning throughout the module, while the guide to the Cole Museum and the searchable catalogue of the Cole Zoological Collection are resources that support the students when preparing their exhibit design and when studying for the examination. The formative learning quizzes in the 'Quiz Centre' section are engaging and provide students with immediate and detailed feedback to enhance their learning and retention of taxonomic principles. To provide further learning support the Taxonomy Explorer section includes a glossary of over 150 key words that appear in the text.

Taxonomy Explorer

Arguably the most educationally rich resource on the CD-ROM is the hypertext guide to the taxonomy of the animal kingdom, which is called the 'Taxonomy Explorer'. This has been designed in close accordance with the latest navigational and presentation principles and includes design features to enhance student engagement with the material, while preventing cognitive overload and providing enough instructional support to ensure all learners can use the resource effectively (Meyer, 2005). The structural design of the Taxonomy Explorer section is based on a tree metaphor, which is highly applicable to both multimedia design and the general principles of taxonomy. This approach to design ensures that students are always aware of their position within the section and are able to visualise their position within the taxonomic tree of the animal kingdom. This design feature should greatly enhance the students' understanding of taxonomic principles and conceptualisation of animal taxonomy.

Evaluation and Development

The first edition of the Animal Diversity CD-ROM is now in its first year of use and its evaluation is ongoing. The evaluation strategy adopted was based on the framework outlined by Jackson (1990) and has included the capturing of students' experience of using the CD-ROM, independent evaluation of whether it has met its pedagogic objectives and assessment of student performance in the module.

Students' experiences of using the CD-ROM were captured using a questionnaire. This was designed to determine their level engagement with it and to examine their perception of it as a learning resource. Their answers indicate that they found the CD-ROM beneficial and that they felt it had improved their understanding of zoology and especially taxonomy. They also found the CD-ROM engaging, attractive and interesting. In addition, initial feedback from academic staff has suggested that the CD-ROM does meet its pedagogic objectives, and, perhaps more importantly, preliminary data from levels of attainment in the module's practical exam indicate that using the CD-ROM has helped the students to develop further both their zoological knowledge and taxonomic skills.

Full evaluation of the CD-ROM's pedagogical outcomes and the collation of end-user feedback are currently ongoing and a second edition is in development. This second edition will include modifications to the structure of the CD-ROM to improve its performance and will also include new content written by the students themselves.

References

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