

Descriptive Account

Experience(s) in creating distance learning texts

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Abstract

A combination of factors including longer working hours, emphasis on professional development, and increased access to the Internet have fuelled the current high demand for distance learning options in tertiary biology. Distance learner students come from a heterogeneous pool of ages, backgrounds and abilities and they require choice in how they learn. Many students still prefer to have their learning materials provided in hard copy as opposed to online. These materials are often edited and produced in-house by module tutors who must learn a wide range of new skills. This paper provides suggestions on how to create distance learning module texts based on the experience(s) of the author.

Keywords: Biology, Conservation, Design, Distance learning materials, Module texts

Introduction

As the demand for greater learning alternatives grows the interest in distance learning is increasing (Savenye *et al*, 2001). Distance learning enables the student to make choices about how, where, and when they learn (Hewitt-Taylor, 2003; Beyth-Marom *et al*, 2003; Cook *et al*, 2004), therefore accommodating variation in prior knowledge, study pace and style (Campbell, 1993). The suggestions and ideas presented here are based on experience gained delivering Napier University's (UK) postgraduate modular courses in Wildlife Biology and Conservation using distance texts. Most of the students taking these courses are either recent graduates of biology and related subjects or they have regular jobs such as veterinarians, zoo employees, and park rangers. They are often individuals "juggling the roles of partner, parent, carer and employee" (Cook *et al*, 2004, p. 270) for whom distance options can make lifelong learning a reality.

There are a myriad of issues to consider when developing distance learning materials but the available funding and time, and the mode of delivery, i.e. electronic, print, or both, are the most fundamental. Donnelly and Agius (2005) established that students enjoy online learning but like to retain some printed material, and Burgess *et al* (2003) found that students wanted hard-copy material supplemented with online exercises. Although online learning presents many more opportunities than books in the way biology can be presented, there is also a risk of information overload (Lee and Tedder, 2003). Furthermore, an online course is reliant on students having good internet access, an issue particularly relevant for institutes targeting developing countries. A hard-copy approach gives the student a product, usually a series of bound module texts; something tangible in return for course fees. These texts also act as a core to the students' studies, and this is emphasised if they are encouraged to write in them and use them as an evolving resource. Hence, this paper outlines the resources and effort required to produce module hard-copy texts for tertiary-level biology courses.

The range of potential hard-copy distance learning material spans photocopied lecture notes gathered together in a file to full-colour, professionally-produced, textbooks. The notes and

guidelines presented here are for a product somewhere between these two extremes, i.e. in-house edited and designed, non-colour, ring-bound books for a modular programme. Although the creation of a distance learning course can be guided by a committee, there will likely be just one or two persons in charge of actually editing, designing and producing the books; this paper was conceived as a 'one-stop-shop' for those individuals.

Getting started

Whether designing distance learning materials from 'square one' or basing them on an existing taught course, they will take a tremendous amount of time and resources to develop, implement and monitor. It is important to be as realistic as possible about what can be achieved (Curry and Smith, 2005). Without a huge commitment it is unusual for anything other than short courses to be fashioned *de novo*, as the research and development required is enormous. The majority of institutions in a position to implement a distance learning course will likely have some existing material at hand. Depending on its quality (and copyright issues), this material can dramatically reduce the time it takes to create a distance learning book. It is, however, unlikely that notes and figures used in biology lectures will be in a suitable format for publication and some work will be required to transform them. Other aspects such as marketing, evaluation, administrative issues, and long-term support will all have to be tackled eventually (Scollin and Tello, 1999; Maclean *et al*, 2001).

Technical aspects of the book design, text style and layout

As it influences almost every other aspect of the contents layout, page size is the most important decision to make regarding the overall look and feel of a textbook (Hartley, 1990). Although not very exciting inherently, for in-house projects an A4 portrait format (210mm × 297mm) is the obvious choice as it is convenient for word-processing, copying, binding, etc. A4 is large enough to accommodate the issues on text and layout raised later in this section, as well as helping to keep the page count down. Regular matt white paper (80 to 90 gram) is suitable and, for those with poor vision, easy to read from (Evetts and Brown, 2005). The books should be able to withstand heavy use and so ring binding (preferably metal), rather than stitching or gluing, is recommended. Having a nice cover design is clearly desirable and is one area where it is worth budgeting for colour printing. The nature of the course will influence what message is portrayed, but at the very least it should make the student want to open the book! One of the most economic options for jacketing a ring-bound book is to have, front and back, acetate sheet over 160 gram card.

What text to use and how it is laid out is a combination of some generally acknowledged rules and personal taste (Hartley, 1990). For students with very poor eyesight or dyslexia not all fonts are equally easy to read (Evetts and Brown, 2005), e.g. serif fonts such as Times New Roman are more difficult than those without serifs such as Arial, Helvetica, Verdana, CG Omega and Tahoma (Evetts and Brown, 2005). Letter and word spacing, size of font, and the use of italics and bold are all important factors that must be considered. Most standard letter spacing, as found for Courier for example, is acceptable (Chung, 2002), but justified text can cause problems for some readers as the spacing among words plays a part in word recognition. Left aligned text is best. The font ought to be 12 point or larger, lower case, and the use of italics should be minimised (Evetts and Brown, 2005). A4 paper with wide margins and 12 point Arial font text ensures lines are the ideal reading length of 60 to 70 characters (Evetts and Brown, 2005). Providing wide margins also encourages students to make notes, thus enriching the books as a resource.

From both perspectives of design and ease of reading the number of different fonts used in the same publication is best kept to a maximum of two. Using a variety of headings, however, is a fundamental part of signposting, i.e. creating an easily navigable format that becomes

familiar to the student (Curry and Smith, 2005). Hartley (1990) discusses the use of primary, secondary and tertiary headings, each with an instantly recognisable style, e.g. uppercase, lowercase bold, and lowercase italic. Any more than three types of heading (perhaps four when including chapter headings), i.e. 'multiple cueing' (Hartley, 1990) is likely to lead to confusion. Signposting can also help keep paragraphs short, making them easier to read (Hartley, 1990; Evett and Brown, 2005).

Introduction to the book and teaching team

The greatly reduced level of contact with tutors often experienced by distance students is one of the main drawbacks of such programmes. The introduction to a distance learning text is the ideal place to be friendly, supportive and offer some of the structures that an on-site student would have easy access too. For instance, it may include a short introduction to the teaching team, a team and/or individual photographs and list of contact details and areas of expertise, some frequently asked questions (FAQ), and a personal study organiser/calendar/diary covering the duration of the module (Smith and Curry, 2005). This section could also highlight the benefits of distance learning, describe the organisation of the book, and draw attention to features such as learning outcomes, self assessment question and further reading. This first section of the introduction can be repeated in all the books used in the course.

The second part the introduction can set forth what the subject covered in that particular book will be plus any other relevant information, e.g. some subject background, module scope, and the full details of the assignments. As distance learning involves so much autonomy it is important to be explicit to the student about how each module works (Smith and Curry, 2005); being forthright with assignments is part of this process. Not sending the assignments separately also reduces postage — and the associated possibility of losing them in the post.

Plates, figures and copyright

Figures, including images, graphs, and flow-charts, provide alternative means of conveying information as well as enhancing the appeal of a book (Hartley, 1990), but there can be complex copyright issues associated with reproducing them (Bruwelheide, 1997; Buttler, 1999). From a legal standpoint, the best figures are original ones that have not been published previously. For most institutions, the widespread use of digital cameras has increased the number of images that fall into this category; furthermore, they are already in an electronic format suitable for placing in the text. Tutors usually have some pertinent graphs and flow charts, etc. but the quality is often poor. Electronically redrawing non-photographic figures in a vector based programme such as Adobe Illustrator® will guarantee a sharp result. It is possible to use this approach to scan in and copy over published figures, but this is also a copyright minefield. Just stating "redrawn from Smith, 1978" will probably not suffice! As copyright law is highly dependent on locality and circumstances, it is worthwhile searching for the latest information applicable to your own project.

The internet offers a huge potential source of useful material, but it has to be assumed that everything is copyrighted, even if this is not mentioned on the website itself (Bruwelheide, 1997). Some sites, e.g. the US Fish and Wildlife Service, the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA), offer public domain, copyright-free images and just ask that a credit is given. Many other websites allow use of their images for educational, as opposed to commercial, purposes. This is another grey area as, although distance learning books are undoubtedly educational, students have to pay for the course. Other possibilities include Dover® Publications' excellent series of CD-ROMs and books; these are essentially catalogues of images that can be used with some restrictions. They are particularly good for natural history lithographs. If there is any uncertainty regarding the copyright status of any material, it is best to contact the publisher or

website owner to check; they are generally obliging when they realise the project is relatively small in scale.

The chapters

If the distance learning course is running parallel, or based on, an existing curriculum the simplest approach is to match the chapters to the lectures, i.e. the first chapter contains, more or less, the same information that would be delivered in the first lecture, and so on. Some courses that offer on-site and distance options provide opportunities for both sets of students to meet, during residential fieldtrips, for instance. Keeping lecture and distance learning materials tightly coupled reduces opportunity for misunderstandings such as “why have they learnt this while we have not?” Again, for ease of navigation (Curry and Smith, 2005), each chapter should have a well-defined beginning, middle and end.

Embedded support devices (ESD) are defined by Marten *et al* (1996, pp. 77-78) as “a set of formal and content-related add-ons, extensions and elaborations of the printed materials such as pre- and post questions, schemes, illustrations, content pages, indexes, tasks, summaries, advance organisers, objectives, prior knowledge references and study guidelines” and research has demonstrated the benefit of ESD for enhancing learning (Marten *et al*, 1996; Hartley, 1990). Some of these devices have been described earlier—as components of the book’s introduction—but ESD should also be included within each chapter. Other than just figures, tables and learning outcomes; embedded questions and tasks can be used to motivate the student to think beyond the text and seek out new information. These can be in boxes with enough space for students to write short answers or comments. As distance-learning students have often been away from formal education for a long time (Harrison, 1992), study guidelines and tips can be included to encourage good writing, referencing, and data management, as well as offering hints for using the Internet or particular software.

Summaries are important for ensuring that the student has identified the key points of the chapter, as well as being a useful revision tool. Short lists are usually sufficient or, alternatively, a space such as an open box can be provided for students to write their own summation. If publications are cited in the chapter then it is necessary to include the appropriate references. These end-of-chapter reference lists have additional advantages, for instance, they serve as a reading list, especially if key texts are highlighted with a bullet-point or similar device. They also help with the ongoing problem of ensuring students cite their work properly, that is, a tutor can simply instruct a student to follow the same referencing style as used in the chapters.

To make certain that students actually read the book, rather than just complete the module assignments (that may or may not require close reading of the module books), compulsory non-graded self assessment questions (SAQ) can be set at the end of each chapter. Every student must complete the SAQs as part of the criteria for passing the module. As they will not count towards final grades, and there may be as many as 10 or 15 of them, it is best not to make the questions overly demanding. After all the SAQ answers have been submitted a set of pre-prepared model answers can be sent out.

Final pages, evaluation and feedback

Glossaries are greatly appreciated by students and have considerable learning value. They can be made less onerous to create if started early in the general production process, but the difficulty of devising satisfactory definitions for academic terms is hard to circumvent. With the advent of dedicated software, generating indexes is now relatively straightforward. Again, students are grateful for them, and they also add a level of polish and professionalism not necessarily expected. Any forms that need to be completed can also be included in the final pages, a feedback questionnaire for example.

The nature of the feedback for the books (and the course) will vary depending on the number of students, the number of tutors, and the relationship between these two groups. With small numbers of each it is likely that feedback will be a continuous process of interaction (Smith and Curry, 2005). With larger groups both students and tutors may need to be asked formally to fill in reports and feedback questionnaires. Evaluation ought to be both quantitative and qualitative (Smith and Curry, 2005) and should play a key role in directing future developments (Harrison, 1992). Asking questions such as “what is the best piece of advice you would give to future Module Leaders?” (Curry and Smith, 2005, p. 320) are particularly useful.

The combination of responding to feedback and keeping the distance learning material accurate and topical will require updating the books on a regular basis, perhaps as often as once every two years. The process of revision may well not be conducted by the original creators of the texts and it is therefore important to keep the format straightforward and use familiar software. Microsoft® Word is undoubtedly the most widely used word-processing programme and has sufficient features to produce a professional product. Finally, providing a set of guidelines, technical details and lessons learnt, will undoubtedly be welcomed by successive editors.

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