Web Projects for Final Year Biology Students

Vivien Sieber
Centre for Academic and Professional Development, The Learning Centre, University of North London, United Kingdom

Final year biology undergraduates commonly do a research project that may account for 25% - 33% of their final year marks. In place of conventional laboratory/library projects, students have been encouraged to build an educational program demonstrating a negotiated topic. There are a number of distinct stages in these projects which are clearly described before the student begins a project.

Stages in the specification and design of the program and project report

1. Choice of topic
2. Find and evaluate multimedia computer aided learning (CAL) programs and other teaching information available on the university network and the Internet
3. Identify and evaluate the available authoring tools: *PowerPoint*, HTML and web authoring programs *FrontPage*, *HoTMetaL*, *Dreamweaver*, *Flash*, *Authorware*, etc.
4. Collect background material and carry out literature search on the selected topic and produce written summary
5. Specify the scope, content, and navigation of the program
6. Develop the "house style" for individual web pages, menus, buttons, backgrounds of the program and build suitable templates or styles
7. Write the text content for the program
8. Build individual pages, sections and animations and construct the program
9. Prototype, debug and run program
10. Evaluate program
11. Write and produce final project report

1. Choice of topic

A suitable topic was identified by the student and tutor, e.g. DNA Fingerprinting, Chromosome Painting (*in situ* hybridisation), cystic fibrosis. Considerations surrounding this choice included: tutor expertise, access to information and original images, previous projects, other teaching resources available within the department and the students' own interest.

2. Evaluation of teaching materials

Students found, used and evaluated a variety of teaching resources from the Internet, CD-ROMs and materials available from the university network. Evaluation included target audience, subject content, features, appearance, navigation and menu systems and ease of understanding.

3. Authoring tools

Students next selected an authoring tool appropriate to the type of program they intended to produce. They compared presentation software (*PowerPoint*), web authoring tools (HTML, *HoTMetaL*, *FrontPage*, *Dreamweaver*, *Flash*, etc.) and *Authorware* 3.5 (a multimedia construction package) in terms of ease of use, help files, and resources (animation, buttons, graphic handling, form creation, etc.).

All found *PowerPoint* too limited because it does not provide alternative navigation pathways and animation is limited. *Authorware* was excluded for the opposite reason as it would take too long to learn to use such a specialist tool effectively. HTML was chosen as it provided maximum flexibility coupled with relatively simple programming. Students elected to use *HoTMetaL* or *Dreamweaver* augmented with *Flash*.

4. Literature search, collect and evaluate information

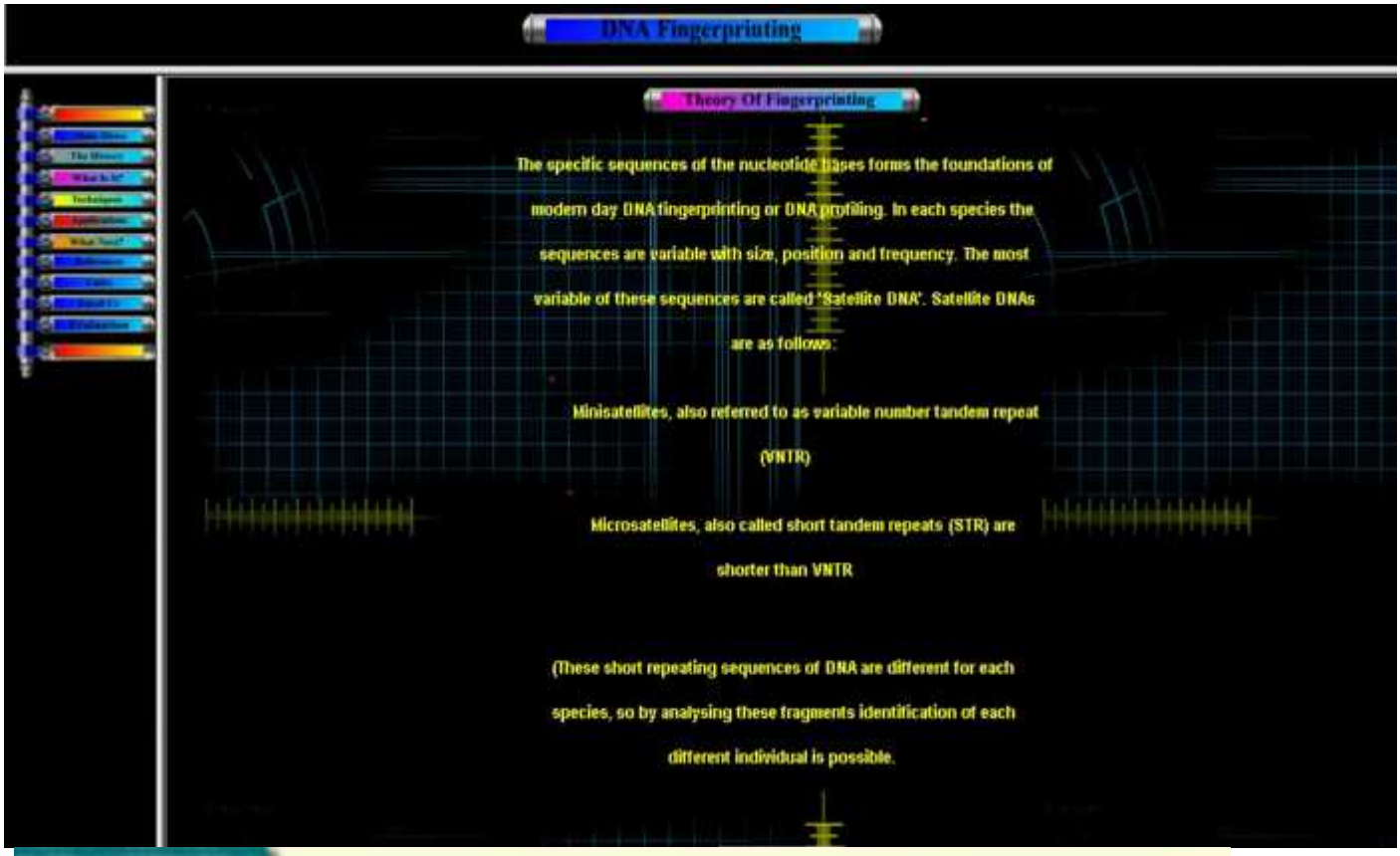
General background and recent research findings were collected from textbooks, the Internet, library search engines and relevant journals. The process followed during this part of the projects was that of a conventional library-based project. This work formed a 2,000 - 3,000 word section of the final report and provided the content for the subsequent program.

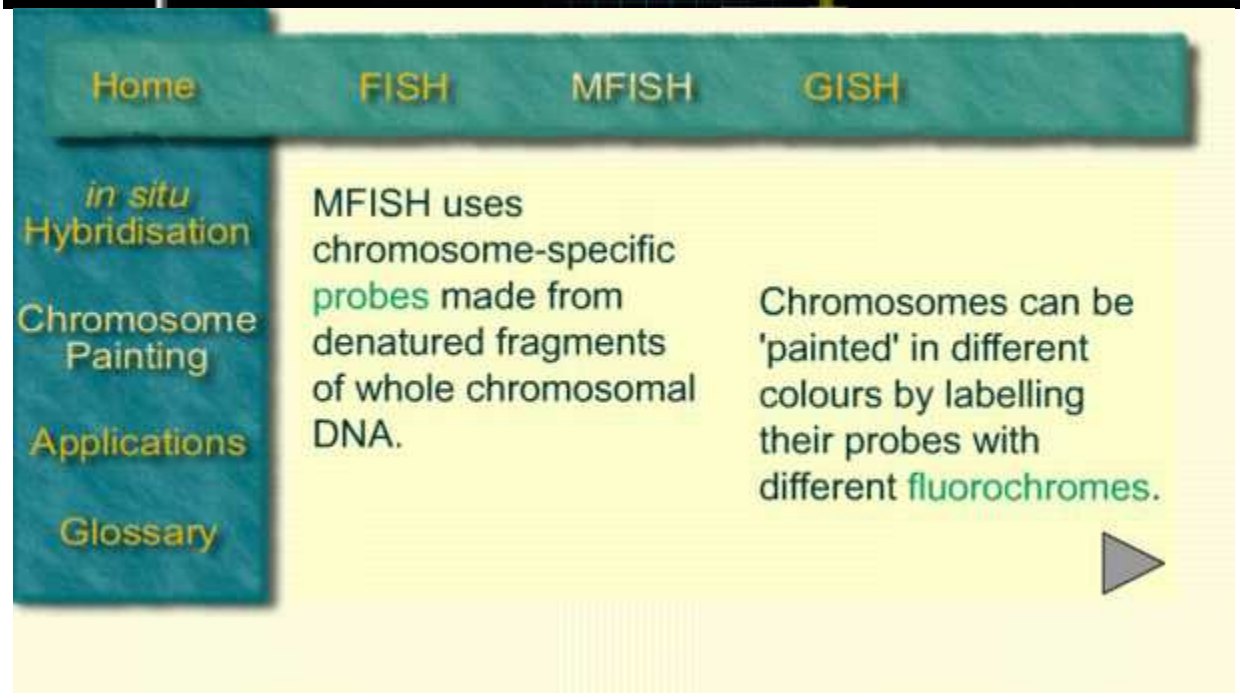
5. Design program

The structure, content, and navigation routes through the program were specified. Diagrams of the program were produced and discussed with the tutor. Particular care was taken to check the student was clear about the relationship between program structure and content and the student was encouraged to develop ideas on the visual appearance of the program.

6. House style

The appearance of individual screens: background, navigation buttons, etc. was specified. There was considerable variation between students, for example one wished to produce something "young and funky" and built several different screens in *Dreamweaver*. Fellow students then identified the one they found most attractive. In contrast, another student specified a simple scheme with a parchment-like background. Figures 1(a) and (b) show the products of these two approaches.





Figures 1(a) and (b). Alternative "house" styles defined in two projects

7. and 8. Write the text content for the program, build individual pages, sections and animations and construct the program

Producing content was straightforward, most of the material had been written during the literature search and evaluation. However, during this stage it became clear to some students that further research was needed to understand the topic fully. Teaching is a recognised way of testing one's own understanding as the need to explain a topic clearly identifies omissions of understanding.

9. Prototype, debug and run program

Students clearly enjoyed this stage and apparently had few problems, they requested little supervision and were generally working at home rather than at university. Email contact was maintained, either where the student had a simple question, sent files for comment or when the tutor enquired about progress.

10. Evaluate program

Time constraints meant that there was variation, some students did not have time to elicit feedback from the colleagues. However, one student included a feedback form in his program and an analysis of feedback obtained from fellow students formed part of the final report.

11. Write and produce final project report

The process of writing the final project report was no different to that of a conventional laboratory/library project and was straightforward, especially as several sections had been completed and revised during the course of the project.

Conclusion

These projects have been extremely successful; they provide a rigorous alternative to laboratory projects, encouraged independent and active learning, and attracted first class marks. Students were given the opportunity to explore Communication and Information Technology influencing their subsequent career choices. One, offered a job after demonstrating his project, is a trainee web page writer. Another chose a MSc combining biology and computing. Advantages for the tutor include an inexpensive project and teaching resources for future students.

Acknowledgements

Thanks are due to Sadik Bakash and Darren Singleton for screen captures taken from programs produced during their projects.

Vivien Sieber
Centre for Academic and Professional Development
The Learning Centre
University of North London
236 - 250 Holloway Road
London N7 6PP

United Kingdom
v.sieber@unl.ac.uk