

***Multimedia
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THE DESIGN & INTEGRATION OF WEB-BASED RESOURCES IN THE MODERN LANGUAGES CURRICULUM

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1. Introduction: Encouraging learner autonomy whilst retaining the intellectual integrity of academic programmes is a priority for all of us working in higher education and one that the World Wide Web may help us to address. We began to look at the World Wide Web as a source for teaching and learning materials for French a number of years ago and, although we found a lot of accessible material in French, there didn't appear to be too much of any real quality for our content modules on literature and history. All the talk we'd heard about the web's educational potential seemed exaggerated: it was still a better place to visit for materials on Star Trek rather than Sartre. If we wanted to make the World Wide Web a valid learning resource — and it seemed to us that it had great potential — we would have to design and author our own materials.

From the beginning of the 1995/6 academic year Charlie Mansfield, from Learning Development Services at the University of Sunderland and I attempted to do just that. Like many colleagues in universities throughout the world, we created our own home page (<http://www.sunderland.ac.uk/~us0cma/comm.html>) with information about the teaching team, modules available and links to other relevant web sites. We took this a stage further however, by producing our own web-based study materials accessible via our home page and by attempting to integrate them into the teaching and learning strategies of a number of French studies modules at all three levels. The French literature and culture modules offered at all three levels were an obvious choice given the difficulties many of our undergraduates encounter when studying literature and the French teaching team's commitment to the continued intellectual validity of such modules within French studies.

This paper will reflect on our experiences of producing such learning resources and integrating them into existing teaching and learning practices. It will discuss, in particular, what we have found to be some of the principal issues relating to the design and integration of web-based learning resources. The key issues we've debated when developing them have been:

- *Formats:* what design features are most useful?
- *Interactivity:* how might one best create a dynamic role for the learner?
- *Integration:* how might one incorporate these new learning environments into existing teaching and learning activities?
- *Learner support:* what kind of support do students require in order to make full use of these new learning environments?

2. Formats: What has particularly interested us as we've developed materials for the World Wide Web is the question of the best possible forms these materials might take. How might we make the most of the potential of web-based resources and fully

exploit their difference from print-based hard copy? What are the most useful design features? Our discussions led us to produce three different types of web-based study materials which we have called:

- *linear*: these consist of lecture notes that have been made into web pages with little or no modification to their organisation;
- *multi-frame*: this is a development of the linear model but, using the new technology of html3, the computer screen is divided into two distinct frames (in a roughly 60:40 split) each containing different sorts of material;
- *search engine-driven and fragment-based*: this, as its name suggests, involves lots of smaller portions of text which are accessible, not through a conventional menu but through a search engine which responds to the inputs of the learner.

2.1. Linear: The linear type of web-based study materials are essentially lecture notes that have been made into web pages with little or no modification to their organisation. The user reads from left to right, from the top of the document until the end. This model is the easiest to produce and to use. A word-processed text is almost all you need as your starting point and a text that moves from introduction to conclusion in a linear fashion is the easiest for users to navigate. So far, we have this type of material for an introductory module on post-war France (<http://www.sunderland.ac.uk/~os0tmc/contem.htm>) as well as for a final-year French cultural studies module (<http://www.sunderland.ac.uk/~os0tmc/intcult.htm>).

The linear module has been a success with Level 1 students in particular who found both the material and their introduction to the World Wide Web and the skills needed to navigate it useful. However, from our point of view this model is fundamentally flawed. The major disadvantage of the linear model, as you might have already worked out, is that there is little or no participation on the part of the user. The user can read the lecture and then print it out for inclusion in their file but, apart from that, they have no other dynamic role to play. Creating a dynamic role — or, at least, a more dynamic role — for the user, designing into our materials some kind of interaction became a priority for our later projects. The next two types represent our attempt to find more stimulating ways of presenting web-based materials.

2.2. Multi-frame: The multi-frame type of material is essentially a development of the linear model but, using the new technology of html3, the computer screen is divided into two distinct frames, in a 60:40 split, each containing different sorts of material. An example of the multi-frame type is *The Zola Pages* (<http://www.sunderland.ac.uk/~os0tmc/zola/0.htm>). The user accesses lecture notes on Emile Zola's *Germinial* but these notes contain a number of hyperlinks which connect to related web pages. For example, the hyperlink 'Emile Zola' connects to a web page containing relevant biographical details, the hyperlink '*Les Rougon-Macquart*' connects to a list of the twenty novels in that series, and so on. Users find this main lecture on the left-hand side of the computer screen where, although users can scroll up and down, it remains anchored in position. When the user clicks on a hyperlink the web page it connects to appears in the right-hand frame. Unlike other web sites, the main lecture is not lost.

From the outset, we designed *The Zola Pages* to be used interactively and in independent study sessions. The new multi-frame technology of html3 helped facilitate this by allowing different parts of the screen to be used for different kinds of activity. The left-hand frame provides the main lecture which places Zola's *Germinial*

in a broader context but it also contains a number of self-study questions. The introductory section, for example, outlines Zola's debt to Balzac's *La Comédie humaine* and contains at the end of the section the question: 'what are the principal similarities between Zola's and Balzac's respective fictional projects?' The right-hand frame is the location for a number of supplementary web pages relevant to the self-study questions, for example, Zola's draft for an essay entitled 'Différences entre Balzac et moi' or Philippe Hamon's succinct definition of the differences between realist and naturalist discourse from *Le système des personnages: Les Rougon-Macquart d'Émile Zola*. This right-hand frame also provides the location for the lecturer's own responses to the questions. Users are encouraged to reflect on the questions, jotting down their response by hand and, when they are ready, clicking a hyperlink to these discussions which appear in the right-hand frame. More ambitiously, by clicking another hyperlink the user can type their own response, then access our own discussion and finally send both, in the form of e-mail, to their own e-mail account. We developed the multi-frame design to simulate the process of using text-based open learning or self-study materials. The classic model for offering materials for self-study is to present learners with a course executive which guides them through the study activities. The executive is usually a narrative text which learners step in and out of as they work. We made the left-hand frame on the screen serve this function. The main frame offers a contextualising location, a single continuous text to reassure and guide the student through the session at the terminal.

2.3. Search engine-driven and fragment-based: The search engine-driven and fragment-based model (<http://www.sunderland.ac.uk/~os0tmc/form.html>) is a more radical departure from the two formats described above. As its name suggests, it involves lots of smaller texts or 'textemes' — all arranged in separate web pages — which are accessible, not through a conventional menu but through a search engine which responds to the inputs of the user. These textemes cover different aspects of Balzac's *Le Père Goriot*, Flaubert's *Madame Bovary* and Baudelaire's *Les Fleurs du mal*. Some of the textemes consist of extracts from key critical works (e.g. 'Lukács on the Post-revolutionary Hero' which features an extract from *Studies in European Realism*) whereas others — the majority in fact — have been adapted from my own lecture notes and cover different aspects of the set texts (e.g. 'Baudelaire: The Poet as Rag-picker'). The level of commentary is fairly minimal as the aim is to encourage learners to develop the skeletal insights that have been offered, following up the bibliographical references which are included at the end of every texteme. An essential design feature of *Les Chemins du savoir* was to encourage students to read more extensively the secondary sources available. *Les Chemins du savoir* is, if you like, more about Gutenberg than it's about Gates. As mentioned earlier, the textemes are not accessible through a conventional index or menu. There is a gap at the heart of *Les Chemins du savoir* which must be filled by users typing in their own keywords or else choosing one from our own list. An easy-to-use search engine was specifically designed by Charlie Mansfield to allow learners to carve pathways through the material available. When the user clicks on the *Chemins du savoir* Web page they first encounter a simple form which enables them to enter their own keyword or else one from our own list for which they wish to search. The search engine scans all the textemes, finds matches and then presents the results of the search in the form of a list of clickable hyperlinks. These hyperlinks reference the documents in which the keyword was found and include, in parentheses, the number of occurrences of the

keyword in each texteme. Having read a texteme, users can return to the list of hyperlinks and select another texteme to read or else return to the original search form in order to perform another search.

A key aim of the design of both search engine and textemes was to encourage learners to see the learning process as about making connections. Each texteme has been written to stand on its own and to make sense without reference to any other. This is the major difference from the other two models: *Les Chemins du savoir* disrupts the linear paradigm and encourages users to make cognitive connections between superficially disparate and unrelated materials. When learners input a keyword, the search engine brings together a number of these autonomous textemes but it is left up to the learner to discover the complex relationships between them. To take one example, a texteme featuring an extract from *The Manifesto of the Communist Party* and another on 'Baudelaire, Poetry and Social Experience' both occur in the search engine's results for the keyword 'modernity'. Learners must think through and make explicit the connections that otherwise remain unstated.

3. Interactivity: The question of format cannot meaningfully be separated from the question of interactivity. We found very early on in our experience with learners in workshops and in feedback questionnaires that those formats that allowed the user a dynamic role tended to be considered of greater use to the learner. The linear module proved popular with Level 1 students who were, in the main, new to the World Wide Web and who therefore particularly appreciated its simplicity. It did not find favour, however, with the Level 3 students who were unconvinced of its advantage over a printed text. They liked having the lecture notes available to them — what student wouldn't? — but retrieving them from the web was considered an experience of limited educational value.

The experience of working with texts on a computer screen, of inputting words or text and getting some kind of response back was considered a more challenging experience. And here, we get on to the question of the essential difference between web-based resources and more conventional print-based resources. The former can, in their limited way, answer back, engage the user in some kind of interaction in a way that the latter cannot. Web-based materials can provide something of the challenge that one might associate with peer-group and teacher-student contact in seminars and tutorials. The independent learner can enjoy something of this motivating contact with web-based resources. They can search for information relevant to their modules, collect their own responses electronically (onto disk or a unix server account, or via e-mail to themselves) or, more ambitiously, participate telematically with their peers with so-called conference-groups within their e-mail accounts. The web-based interaction continues, extends and enriches the lecture and seminar contact hours. Web-based materials are therefore a supplement, rather than a substitute, for more conventional teaching and learning activities. This approach stands in contrast to the notion of a 'virtual' university in which web-based materials are seen as offering support and stimulus to remote learners. Most of us teach in 'actual' universities with 'actual' students who are in need of a wide range of varied and imaginative learning resources. Interactive Web-based resources can help meet this need.

4. Integration: The question of designing interaction into Web-based resources is, of course, closely linked to that of integration into the teaching and learning strategies of the subject. One should not underestimate students' resistance to new technologies,

particularly amongst students in the humanities who, in our own experience, will only take time engaging with the web and developing the skills required to navigate it, if it is perceived to be directly relevant to their programme of study.

One initiative we have recently begun to take, to integrate web-based resources more fully into our teaching and learning strategies, has been to make the web the delivery platform for information on our modules in place of the usual print-based module guides. *Pages dix-neuf* (<http://www.sunderland.ac.uk/~os0tmc/19/main>) is an example of this and allows access to details of the teaching schedule, assignment and oral exposé titles and so on, as well as to relevant resources produced here and elsewhere. *Pages dix-neuf* is also a very real attempt to reduce the direct costs of photocopying, the environmental impact of paper use and the unnecessary burden of overloading learners with papers and handouts. Students are encouraged to see the page and the resources it links to as a necessary preparation for and continuation of lectures and seminars. Its value in preparing students for the module ahead is important in the context of the modular structure of most university programmes which allow students very little time to orient themselves to the new modules they are faced with. It's also important to stress the ways in which the web-based resources continue, develop and extend ideas covered in lectures and seminars. During lectures learners are asked to take down not more than one or two A4 sides of notes. These notes could consist of nothing more than a list of the main issues and questions raised or of important keywords. The function of the lectures is to provide a more general survey of the territory that can then be explored in greater detail on the web. Students are encouraged to produce their own *cahier télématique* onto which they store materials quarried from the various textemes. The information which the learners download becomes an ongoing personal learning resource which they can supplement at any time and which can form the basis of their written assignments. We've even encouraged students to make the web the starting point for their written assignments. Students can copy and paste written assignment titles from *pages dix-neuf* onto their *cahier télématique* and think through a question and brainstorm ideas with help from the *Chemins du savoir* search engine. They can confirm if they are on the right track by typing certain keywords into the search engine and checking to see if they have found a rich seam or not. Once they have constructed an argument they can return to the search engine to help organise evidence to support it.

5. Learner support: In all our development of learning materials on the web we have adopted a prototyping approach, best summed up by Marland and Store (Harry et al., 1993: 154) in their model for writing and using instructional materials:

construction -- trial -- rewrite -- trial (Pragmatic Cycle)

One very useful outcome of this approach is the way that it informs the work of the teacher and materials developer. We began to detect, by observation in the computer rooms, that learners needed extra support in developing web skills. Although we took the view, when designing our web pages, that the technology should efface itself before a content which is all-important, we found in practice that a certain minimal level of IT awareness was nonetheless required. We were faced with that familiar conflict between skills and pure primary content: should we be teaching telematics or French? We opted for a compromise that acknowledged our role in web-skills training as well as our need to reduce the amount of contact time devoted to such skills to a minimum. The kind of support we opted for fell broadly into two categories. Firstly, hands-on web-skills training in a workshop situation. We tackled this initially by

team-teaching computer-lab sessions, bringing in Charlie Mansfield to assist in the first lesson the French team member delivers. There's a strong element of added value here as both the lecturer as much as the students gained from the experience of team-teaching with an IT and education specialist.

What was particularly striking about our early hands-on sessions was the lack of consistency in students' engagement with technology and the apparently simple skills (keyboard skills, manipulating the mouse, etc.) required to use it. Students' expertise in the general use of IT then was extremely variable: some had done a lot at school or sixth-form college and had a computer at home, others had opted for an 'IT for All' module, but many more had got through to university with very little exposure to IT. To attempt to redress this imbalance we produced help sheets for use in the students' own time. More recently still, we have written an independent study booklet entitled *Web Skills for Language Learners* in a project funded by our teaching and learning budget. In *Web Skills for Language Learners* we address, through explanatory passages and activities, many of the difficulties past students have reported to us in feedback. We wrote and designed the A6-format booklet so that it could be used both next to the computer and for reading away from the computer room to make the most of the learners' time at the machine.

Because browsers like *Netscape* and *Netscape Navigator* are relatively user-friendly interfaces, we took the decision to place particular emphasis on using search engines and on reading URLs. We chose these two activities because searching accurately and gleaned as much initial information as possible from the results of searches are important first steps in becoming a critical web user. Thus equipped, students can begin to discriminate for themselves.

6. Conclusion: It is valid to note in this paper that the kinds of shifts that are taking place in practice and in orientation have led to this university providing staff development for lecturers so that they are able to take on the task of web-page authoring themselves. We feel that new tools like html3 and JavaScript, are providing the teacher with an entry into on-line materials design that programming languages such as C+ and multimedia authoring software have not provided. It's fair to say that many institutions cannot provide development staff for every new courseware design project and, indeed, many teaching staff feel that they can produce learning materials that are integrated into their normal teaching programmes after good staff development and education.

We've completed a number of successful Internet projects in French Studies since 1995 and will continue to tackle increasingly ambitious design developments using the latest web tools as they become available. The flexibility that this communication medium offers the skilled educational designer provides many exciting opportunities for enriching and managing the learning environment.

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