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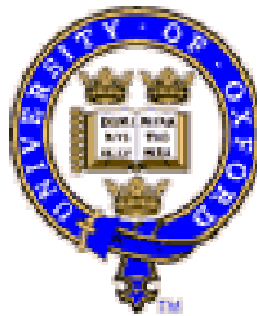
TELRI

TECHNOLOGY ENHANCED LEARNING IN RESEARCH-LED INSTITUTIONS

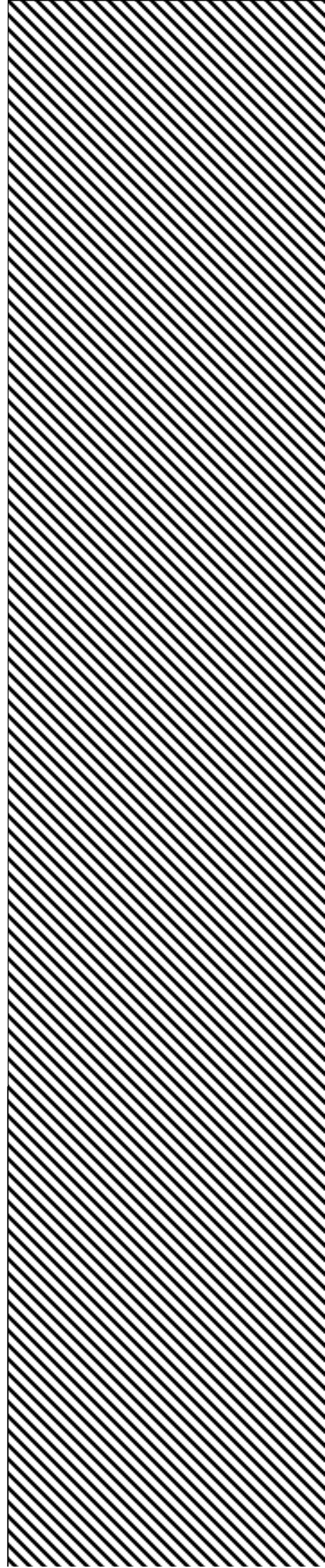
Project

The focus of the TELRI project is on  
what research and learning share...

a culture of personal  
inquiry, creativity, and  
expression



THE UNIVERSITY OF BIRMINGHAM



# TELRI TECHNOLOGICAL APPROACHES

Learning technologies can support the development of cognitive skills if they are used in a planned way. The project team has implemented these approaches in courses across a range of disciplines at the Universities of Warwick and Oxford.

C&IT tools that provide opportunities for learners to give meaning and value to information are particularly useful, whilst those that facilitate critical reflection on working processes and the expression of a student's own ideas are also vital. Such tools are most effective when they offer immediate feedback to the learner from peers and tutors.

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**“opportunities for learners to give meaning and value to information”**

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TELRI believes there is value in document sharing and discussion, through virtual learning environments and conferencing software. The increased visibility of student work makes educational processes more explicit both to students and to tutors. Furthermore, where such activities are the main focus of the course, especially where contributions during the process are linked to assessment, the approach can ensure active participation by all students.

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**TELRI works alongside staff ... developing students' capabilities**

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There are many commercial tools available that support such interactions, and TELRI works alongside staff if they have an appropriate tool available to them, assisting them to make the most effective use of it in developing students' capabilities. However, in recognition of the lack of such software in many institutions and the need for simple, cost-effective solutions, TELRI has developed a simple web publishing tool that facilitates these basic functions and avoids the complexity and expense of commercial software. The TELRI tool enables students to publish work, ideas, comments and discussions on the web without requiring specialised web page publishing or production skills.

## DEMONSTRATION

Try out the TELRI approaches at  
our web publishing demonstration site at:  
[www.telri.ac.uk/demo/](http://www.telri.ac.uk/demo/)

TELRI uses learning technologies to support the development of research-like approaches to learning.

There is wide agreement in higher education that gaining a degree means more than mastering subject content. Cognitive and subject-specific skills are increasingly emphasised, in the belief that they are transferable to other situations, and course and module descriptions increasingly reflect this. However, it is not easy to design courses that develop, through their processes and assessment methods, some of the most valuable skills.

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**“exploring the relationship between research and learning”**

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Through the work of the TELRI project, we have been exploring the relationship between research and learning. Good researchers are innovative, independent and analytical. They are problem setters and solvers, and may handle large quantities of information from many sources. We believe that undergraduates also need these capabilities if they are to fulfil their learning potential in their studies and in later life. The capabilities require the presence of a body of disciplinary knowledge and techniques used within the discipline, informed by higher order cognitive skills.

The TELRI project has focused on the cognitive skills of researchers, defined some of them, and suggested how they can be developed and assessed. In particular, we highlight two learning processes, which are complimentary and mutually supportive. The first is adoptive learning, which makes use of established and well-understood knowledge and techniques in bounded situations. The second is adaptive learning, which requires higher level thinking in more open situations, and is particularly valuable in research activity. We argue that researchers’ learning processes can and should inform course design.

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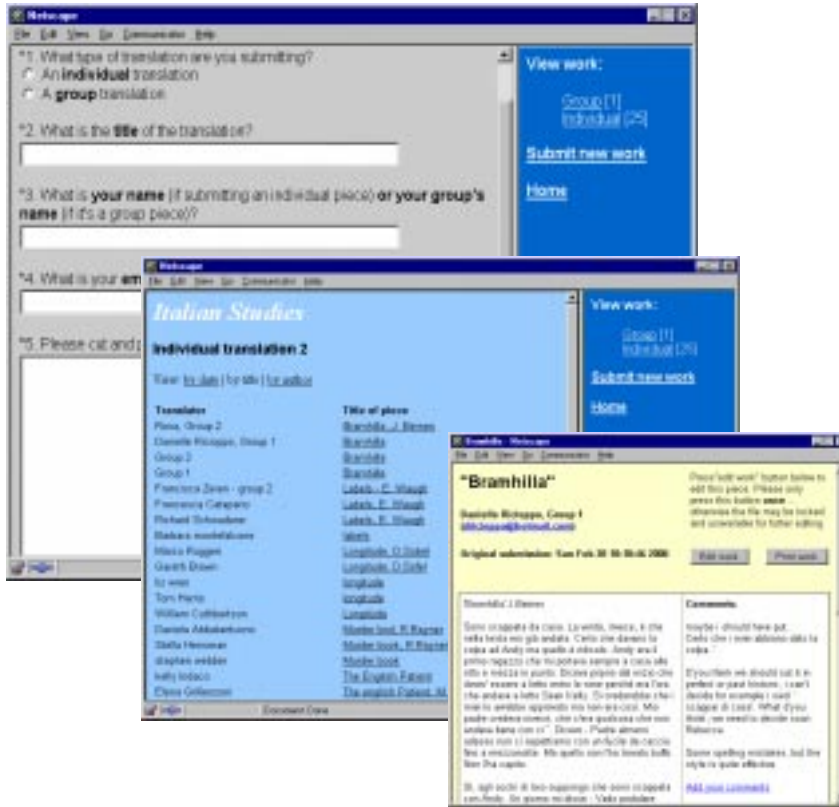
**“researchers’ learning processes can ... inform course design”**

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TELRI approaches assist staff to make such learning processes explicit, develop students’ abilities in effective study and reflection, and provide opportunities for innovation to develop higher cognitive skills and foster creativity. TELRI course design guidelines offer a means of achieving these aims, helping staff to make clear choices of methods and media for teaching, learning and assessing.

TELRI approaches can be extended to learning and assessment across a broad range of educational settings, particularly in professional development, but also in schools and further education.

# TELRI CASE STUDIES



## Italian Studies Translation

In a third year Italian Studies module at Warwick, students first submit their own version of a translation, discuss in small groups each other's approaches in terms of translation technique and the intended purpose of the text, and finally submit a group translation.

Contributions to the discussion in terms of critical analysis, creative ideas and reasoning provide evidence of a student's development rather than the actual final translation produced.

## TELRI IN THE HUMANITIES

In the arts and humanities, research capabilities are developed through discussion and debate, activities which are essential to the testing out of ideas and the finding of meaning. C&IT tools that support and extend this 'tutorial' type of environment are valuable for enhancing teaching quality, particularly with increasing class sizes. Technologies for viewing, submitting, and commenting on work provide:

- Additional or alternative means for students to express themselves, often resulting in increased motivation and sense of ownership.
- Scope to reflect more deeply than is often possible in timetabled groups.
- A higher degree of focus for face-to-face classes.

## French Language Learning

A module for non-specialists run by the Language Centre at Warwick focuses on a single assignment involving research, presentation, discussion and analysis. Two groups of 30 students are asked to choose an image, conduct some background study and upload an analysis to the web. This work forms the central theme to a presentation, a question and answer session and a written piece incorporating further research suggested by the peers. All aspects are delivered in the target language.

Tutors noted that both the presentations and the written work are of a consistently high quality with a more advanced use of language. The free choice of image forms a focal point of the activity. Students are highly motivated to pursue background research, participate through self-expression and produce a publishable document. It was clear that the transparent use of technology is a success factor.



## TELRI IN THE SOCIAL SCIENCES

In the Social sciences, research capabilities manifest themselves in students' abilities to evaluate evidence and construct arguments, processes that rely on discussion and debate as the major forum for learning, in addition to opportunities to practise and apply theories and concepts. Tutorials and small group work are most commonly used. Students prepare joint presentations or work through problems and case studies. The approach is most beneficial in developing higher levels of abstraction and evaluation when they introduce to the students 'real world' issues, particularly through the lecturers' academic research and through the use of primary materials rather than text book sources.



### Comparative American History Reviews

A second year core module on North American Themes in the Department of History at Warwick is based on lectures and seminars. Sharing review work on the web enhances students' reflection on their approaches to research and the development of evaluation and critical analysis skills.

This work is used as a basis for discussion in seminars. An online discussion board is currently being integrated into the approach. Since original source material is often difficult to access, the approach provides a purpose for using web-based resources, such as research journals and the TLTP History courseware. Furthermore, it builds up a resource base of critical analysis that is reusable in future courses.

The tutor comments that the TELRI approach enhances the students' motivation to read the texts, their willingness to take risks and exchange ideas and their level of reasoning and abstraction of arguments.

### Local History Online

In the Department of Continuing Education at Oxford, TELRI has assisted in implementing research approaches into an online local history course based around the use of databases. The purpose of the course is to develop students' abilities to analyse critically approaches to data search and query techniques appropriate to supporting concepts and arguments.

The course is currently run as a mixture of online and offline material. That is, it has a traditional print-based focus (using PDF files for downloading and printing) backed with network support in the form of collaborative work and discussion provided by WebBoard conferencing software.

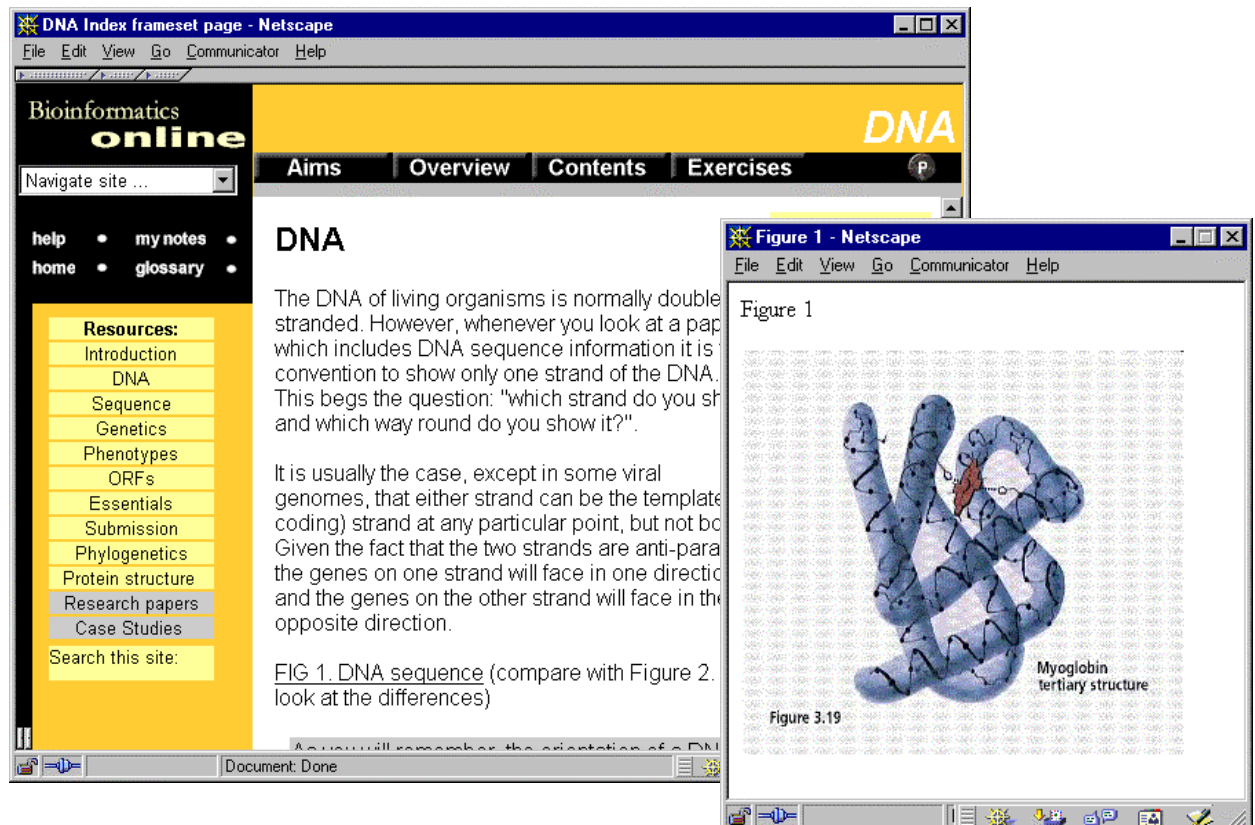
Local History Online is one of the courses being developed by the TALL programme: [www.conted.ox.ac.uk/tall/](http://www.conted.ox.ac.uk/tall/).



# TELRI CASE STUDIES

## TELRI IN THE SCIENCES

Research capabilities are developed in Sciences curricula through sophisticated problem solving and reasoning skills. Course activities focus on the students using and evaluating a wide range of information sources and methods to interpret data and help solve problems. A common approach is through "practise with feedback" using increasingly open contexts or complex real world problems.



The image shows two overlapping Netscape browser windows. The larger window on the left is titled "DNA Index frameset page - Netscape" and displays a website for "Bioinformatics online". The site has a navigation menu with "Aims", "Overview", "Contents", and "Exercises". A sidebar on the left lists "Resources" such as Introduction, DNA, Sequence, Genetics, Phenotypes, ORFs, Essentials, Submission, Phylogenetics, Protein structure, Research papers, and Case Studies. The main content area is titled "DNA" and contains text explaining that DNA is normally double-stranded but only one strand is shown in sequence information. It also discusses the orientation of strands and mentions "FIG 1. DNA sequence (compare with Figure 2. look at the differences)".

The smaller window on the right is titled "Figure 1 - Netscape" and shows a 3D molecular model of a protein. The model is blue and red, with a caption that reads "Myoglobin tertiary structure". Below the model, it says "Figure 3.19".

## BIOINFORMATICS

A new course on Bioinformatics is being developed collaboratively by TELRI working with the Departments of Biological Sciences at Warwick and Zoology at Oxford University. The course integrates a problem-solving approach with critical discussion of appropriate approaches and choice of techniques. The course develops abilities to solve a real research problem in the area of genomics.. The need to develop knowledge and techniques is driven by the students' need to work through the problem.

The final assessed output is a research report, which emphasises the students' reasoning and justification in deciding the appropriate procedures and resources to utilise. Through this approach, students gain understanding of (i) how different programs require data to be inputted in different formats, and (ii) the importance of this in terms of obtaining a sensible answer to data analysis. These are prerequisites to performing accurate research.

Using web publishing, student upload an overview of how they plan to tackle the report write-up that they will eventually submit at the end of the course. A blank notice board input area on the web site allows students and tutors to add comments. The course also uses web publishing to facilitate student submissions of web resources relevant to their work and to support decision making.

## INTERESTED IN TELRI?

Consider how one of your courses might benefit from TELRI approaches.  
*On a scale of 1-10, indicate by placing a mark in the appropriate box, how you assess the importance of each Learning Outcome when giving course assignments.*

**ADAPTIVE ADOPTIVE**

Learning Outcome	Importance in assessment of course assignments									
	Low					High				
	1	2	3	4	5	6	7	8	9	10
FACTS, ASSERTIONS, RULES AND LAWS										
LANGUAGE AND PROTOCOLS										
TECHNIQUES AND PROCEDURES										
ORGANISATION AND STRUCTURE										
ESTABLISHED RELATIONSHIPS AND PRINCIPLES										
PERSONAL INTERPRETATION, MEANING AND EXPRESSION										
EVALUATION, DECISIONS AND JUSTIFICATION										
ARGUMENTS, REASONING, AND EXPLANATIONS										
SYNTHESIS AND CONCEPTUALISATION										
ORIGINALITY, CREATIVITY, AND INNOVATION										

*If the boxes that you marked fall within the pre-shaded areas of the chart,  
 Then you agree in principle with the basic beliefs of TELRI, and perhaps...  
**WE just passed YOUR first test.***

If you would like to know more about TELRI approaches and appropriate C&IT tools or to obtain our materials, please visit our WEB SITE at:

[www.telri.ac.uk](http://www.telri.ac.uk)

You may also write, telephone, or email the team to request a STAFF PACK, which contains materials to assist you in developing or reviewing your course using TELRI guidelines.

**Information and contact details are on the back page of this brochure.**

TELRI IN YOUR COURSE



# TELRI

TECHNOLOGY ENHANCED LEARNING IN  
RESEARCH-LED INSTITUTIONS

The TELRI Project is led by the Centre for Academic Practice at the University of Warwick, in collaboration with the Universities of Oxford, Birmingham, Durham and Southampton, and funded by the HEFCE from October, 1998 to September, 2001 under phase three of the Teaching and Learning Technology Programme (TLTP).

## WEB SITE

Visit our web site at:

<http://www.telri.ac.uk>

## MATERIALS

TELRI materials are freely available to all Higher Education institutions. Download from the web or request a Staff Pack and all we ask is for you to complete a brief information form for our records.

- Overview of TELRI approaches*
- Guidelines for course design*
- Evaluation case studies of implementations in courses*
- Review of appropriate C&IT tools*
- Demo or set up a pilot using the TELRI tool*
- Workshop materials*

## CONTACTS

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