

## JISC Completion Report Template

### *Project Overview*

#### 1. Background

Through a number of strategic investments by both the JISC and the ESRC, the UK academic community has access to a unique and expansive range of digital data resources. The Economic and Social Data Service (ESDS), of which the UK Data Archive (UKDA) is a service provider, is a national data service that provides access and support for an extensive range of key economic and social data, both quantitative and qualitative, spanning many disciplines and themes. It comprises a number of specialist data services that promote and encourage data usage in teaching and research. However, while individual datasets are used extensively in academic research they are significantly under-used in learning and teaching programmes within Higher Education, at both undergraduate and post-graduate level, and are rarely used in Further Education.

As a national JISC Service provider the UKDA is in a strong position to offer its resources to the learning and teaching communities for developing resources that might be more appealing to teachers. In turn it needs the advice and input from instructors in the classroom on how to develop the pedagogic aspects of learning resources: which content to extract, and how to contextualise and apply raw data; where to position such resources in the learning process; and on the usability and functionality of the e-resources created.

Turning now to education, there is a widespread concern in the UK and further afield, including the US, that levels of data literacy are at an all time low. The UK is simply lacking significantly in a pool of trained individuals who possess good quantitative data analysis skills, and who would claim to have expertise in this area.

The JISC 5/99 Programme Task Force on The Use of Numeric Data in the Learning and Teaching project, centred around how quantitative data are currently used in the classroom, offered valuable insights and evidence into the benefits and barriers surrounding the adoption of data handling in social science teaching practise (Rice et al. 2001). The enquiry looked into the use of numeric datasets in learning and teaching within UK higher education, and into the barriers faced by post- and undergraduate teachers who wish to introduce students to the use of empirical datasets in the classroom. The few HE lecturers using data in their teaching used them either to add an empirical dimension to the subject, to teach statistics or data analysis methods', or to teach numeracy or critical thinking skills. Certainly, the main focus is on using data to teach research methods, with very few using 'live' social data to illustrate substance. For teachers, the barriers to using data cited are largely to do with lack of awareness of data sources, the lack of time available to prepare data and build its use into courses, and finally the lack of access to suitable data both physically and conceptually. The JISC 5/99 CHCC project was one of the first funded activities to look at creating e-learning resources for statistics in context, based on census data (CHCC 2003).

The Economic and Social Research Council (ESRC) has also recognised the same problem regarding quantitative research methods skills of social science postgraduates, and has recently introduced strategies to try to redress the situation. An example is the introduction of mandatory quantitative methods training courses for PhD students (ESRC 2001).

Regarding mathematical education of post-14 school age children in the UK, the recent report, *Making Mathematics Count*, suggested that current curricula fail to meet the needs of learners and satisfy the requirements and expectations of employers and higher education institutions (Smith 2004). The DfEE, with guiding support from bodies such as the Royal Statistical Society, is thus seeking to improve ways to give young people confidence with numbers and in data handling across the curriculum, not only within the confines of mathematics education per se. An example is the and the CensusAtSchool project (2003). Evidence from the US suggests the same worrying situation (Steen 2004), and various forums have been established, such as the National Numeracy Network (NNN) by the Mathematical Association of America (MAA) to help support schools and colleges that are exploring ways to infuse quantitative literacy into their curricula. The recent Tomlinson Report

(2004) which looked at secondary education, proposed major reforms for a new diploma-based system designed to offer more specialised work-related learning that would also better prepare students for higher education. Key to the recommendations would be the requirement of all students to complete core communication and numeracy skills elements.

Thus it is now accepted that the benefits of working with real life data sources are significant. These include understanding how statistics are created, how published tables and graphs (e.g. opinion polls in newspapers) are interpreted and how to begin to manipulate and analyse data. Not only does practical knowledge about survey methods and secondary analysis teach students how research is actually conducted, but it informs critical assessment of arguments based on the interpretation of survey data. Data are never isolated from theory, and it is never the case that data ‘speak for themselves’. Introducing such concepts early on in post-16 education is one way to address the quantitative skills concerns expressed above, and students gain a tangible and marketable skill that they can use in future employment.

From a pedagogical point of view, these inquiries provided the driving force behind the Survey Data in Teaching (SDiT) project. They provided an exemplar in this area.

The X4L SDiT project did fulfil part of the need originally envisaged, but it has also opened up new pathways and opportunities that need to be explored. As there are still relatively few instances of good examples of repurposing of JISC assets amongst the social science teaching communities, we see this as first steps in helping social science teachers and learners to embrace e-learning using JISC resources.

It is critical that JISC and other funding bodies help create further opportunities through networking and funding for social science teachers to collaborate with national data resource such as UKDA providers to contribute further novel and engaging teaching materials, and e-learning strategies, to this area that is currently heavily lacking in such resources. Data literacy is an area that is so critical across the board, yet currently hard to teach using conventional approaches. Through this small project, we believe that the UKDA has shown how it can help to make this area of learning appealing through real life data confrontation and e-learning.

## 2. Aims and Objectives

The SDiT project aimed to consider how repurposing existing data resources housed at the UKDA for teaching and learning might increase their use, while recognizing that there is considerable scope for increasing use of specially tailored teaching datasets and associated online learning materials within the FE sector. Simplifying and re-purposing complex data, for example, the larger government survey datasets held by the UKDA, is one way of opening up their accessibility.

In attempting to meet the Programme’s key challenge of elucidating strategies that might encourage sustainability and widespread adoption of e-learning materials, the project was primarily concerned with learning activities, outcomes and models. Thus pedagogical outcomes were very much at the heart of the project. In this respect, a longer-term aim of the SDiT project was to find ways of helping teachers and learners work towards improving the data literacy of GCE ‘A’ level and university students to:

- enable a better understanding of the use of social science data as applied to real life problems
- enhance skills in manipulating numerical data - textbooks, newspapers, reports and databases
- conceptualise the characteristics of quantitative data so that they can be used to support substantive arguments
- increase the ability and confidence of students in producing and communicating data
- become critical consumers of these data.

The initial aims of the project were: first to develop, pilot and evaluate a set of survey data-based resources for use in the teaching of social science courses at both HE and FE level; and second, to document the experiences, process and outcomes of the project itself.

The planned resources were based on existing UKDA holdings that would be re-purposed to suit the pedagogical needs identified by the tutors authoring and piloting the teaching resource for their existing courses. It was intended that the resources would add to the growing portfolio of the DNER learning and teaching and help inform JISC in pursuit of their X4L mission.

Thus the key objectives were:

- To produce stand alone and integrated teaching datasets from more complex socio-economic datasets;
- To develop an integrated web-based learning and teaching resource that links together resource discovery tools, and data exploration and extraction tools (NESSTAR) with teaching materials that help address substantive issues for social science teaching;
- To gain evaluation and feedback from piloting this re-purposed content in the area of social science teaching in the HE and FE sectors;
- To provide a model for improving the productivity of teachers by reducing the resources (time and burden) required to incorporate data related resources into learning and teaching courses;
- To improve access to key primary data sources and related resources for the learning and teaching communities;
- To promote increased and more effective use of a national data services for problem-based learning in the classroom.

The key deliverables of the project were intended to be:

- A stand alone teaching survey dataset, that is freely available, without restriction, drawn from the 200 British Crime Survey conducted by the Home Office, available via NESSTAR and via the UKDA Download service (in a number of software formats);
- Teachers' an user guides including tutorials and exercises based on an substantive questions using real life data in social science teaching in the area of crime and social order. These will be web-based and available in downloadable form;
- User guides to aid resource discovery, web-based data extraction and data exploration/visualisation of the teaching datasets via the NESSTAR software suite, suitable for student use. The teachers guide will provide examples of how the resources can be used in the classroom or for self-paced leaning;
- Enhancement of the teaching datasets and learning text/exercises through adding and linking relevant web-based information, such as links to SOSIG resources, the VTS, the Office of National Statistics and other key data resources;
- A fully documented report on the processes used to re-purpose and pilot the learning materials;
- A report from informal and more formal evaluation with project advisors, tutors and students;
- Awareness days for social science teachers (for example held in conjunction with relevant T&L associations) to introduce the resources, the guides and gather feedback on usability and implementation issues;
- Contribution of top level metadata for the SOSIG section on data resources and teaching in politics and two-way linking from and to the resource to the VTS on social science methods and politics;
- Consultation with the JISC NLN learning materials repository to assess the suitability for inclusion and further testing;
- A brief report on how these resources, seen as a prototype, could be applied, or repurposed, in a wider sense to other subject areas based on existing UKDA data resources.

The developments and outputs were conceived to be intrinsically linked and aimed to ensure that students gain a better understanding and knowledge of the nature, context, extraction, manipulation, visualisation, statistical analysis and interpretation of key social science data sources. These skills must be grounded in substantive and intellectual reasoning in relation to the taught subject or curriculum. One further key outcome initially envisaged was to ensure that the resources encourage an easier route to accessing data, metadata, learning materials, and data

exploration/visualisation tools, and thereby encourage student-centred learning and the development of appropriate skills for undertaking project-based work. As such, the resources might be as applicable to distance as to class-based learning.

At the end of the project the Essex-based team felt project to have run very well, fulfilling all of the initial aims and objectives. The most pleasing aspect has been the great enthusiasm that teachers and RSC staff have shown when shown the resources. The only one of the objectives that was not met was the anticipated working with NLN, who we found to be not at all responsive to our requests for discussion. Repeated post-project attempts through various connections have also been made, but we have had no reply.

### 3. Overall Approach

The project ran for 18 months from January 2003 to July 2004. The project was initially broken down into a number of work packages, which represented sequential stages in the life of the project. These are discussed in detail in the Final Report but in summary they followed the lines of:

- Planning and selecting substantive content/topic area of materials for teaching at both FE and HE levels: UKDA working with tutors;
- Selecting and preparing UKDA hosted dataset for the project to suit the topic;
- Establishing a team of advisors, an evaluation plan and a limited promotional programme: making contacts;
- Authoring the learning materials and quizzes;
- Writing the data exploration and data handling guides, exercises and tutor guide;
- Negotiating software and data licence for unrestricted access and usage;
- Translating learning materials/objects to various formats: web, printable documents and presentation formats;
- Testing metadata systems and implementing metadata as advised by the X4L Programme;
- Undertaking programme of evaluation and redrafting materials in light of comments;
- Final promotional efforts and consideration of future desirable embedding strategies;
- Reflection on project experience and processes: final report writing.

The projects outputs, publicity and publications are expected to draw attention to both social science teachers and those who are required to implementing e-learning strategies across their institutions. Feedback from the project has suggested that these kind of resources are welcomed, and much needed in the area of social sciences, for example to teach basic concepts like data literacy. In this respect, the project has been a success.

The project fulfilled all of its promised deliverables, which were largely on time. Overall, the project did proceed quite smoothly although we encountered three instances where changes had to be made to the project plan:

**1. February 2003.** The main change to the project at this stage was in relation to the staffing complement. The original project proposal had costed in a 3-month post to look into metadata standards for the project. In view of the ongoing and proactive work undertaken by CETIS and the strand B projects (e.g. JORUM), this post was considered unnecessary. Additionally the full-time programmer planned for month 3 onwards was considered to be redundant at this early stage in the project. Consequently a .3 - .5 web programmer was appointed who in addition to planning design and functionality kept abreast of the learning object metadata developments.

Additionally, the Project Manager, initially and perhaps too conservatively costed at .1 FTE spent far longer on the project than anticipated. As such a new appointment to support this role was made, whose job was to co-ordinate the planning, development and testing of the learning objects.

**2. August 2003.** The first main change at this stage was in the substantive focus of the project in order to fit in with the FE syllabus. The delay in writing the FE materials did not affect the timing of the evaluation of the web resources for the FE tutor. The HE testing schedule was delayed, as

the final stages of the modules were not in a state that had been translated to the web. Testing on undergraduate teaching commenced in April 2004, with the materials being evaluated by teaching staff and teaching support staff.

One other change that occurred was the re-appointment of a new project officer to replace Andy Wroe (who left on 31<sup>st</sup> August 2003), the staff member initially responsible for pulling together and co-ordinating, very successfully, liaison and strategic thinking between the FE and HE tutors, and drafting of the FE materials. He was replaced by a full-time position at a similar level, who took on the responsibility of planning, helping author materials, and -ordinate evaluation activities

### 3. February 2004.

The original duration of the project was 16 months, January 2003 to April 2004. The project requested, and was granted, an extension to the project by 2.5 months, to enable greater time for evaluation, and in particular to attempt to promote further in the FE sector. The original evaluation plan was conceived as a small and informal programme of work, focusing on feedback from the two teachers involved in the project testing the resource themselves, and on a small group of their students. The Colchester FE tutor with whom we worked on the project was unable to test out the web-based resource on his students in September 2003 as the final version of the web-based resources were not completed (although he used, successfully, the paper versions of earlier drafts of the modules/ learning concepts we had developed). He ended up testing out the web materials in the classroom in June 2004 to coincide with the AS timetable. His experiences provided us with a comparison of three ways of teaching a single topic, with and without the new learning pathways and resources that had been constructed in this project (written up as case study in the Tutor Guide)

At the time of conceiving the project the following assumption were made:

- it would be easy to reach out to FE teachers;
- FE and HE teachers would have time to write/test resources;
- it wouldn't take long to author the materials;
- the key project staff would be part-time;
- the evaluation strategy should be comprehensive;
- 16 months would be long enough for the project;

Thus while we considered the project methodology and subsequent development of the outputs to have worked very well, there were some areas where we would make changes if we undertook this project again.

First, we would recommend that repurposing projects allow more time to author materials and allow for iterative editing between rounds of testing. Thus we would cost in for more core staffing across a longer time span, and formally buy out the HE tutor's time.

The second concerns evaluation. We would certainly admit to being overambitious in our evaluation plan. We scaled down evaluation to a more manageable scale that was highly targeted in areas where we already had some kind of commitment from the institutions or individual staff. Indeed. We would have benefited from allowing more lead time for securing evaluators and testers, as teachers were much busy/inflexible than we had anticipated. We would also allow more time for class-based evaluation to time with appropriate points in the curriculum, sometimes a small window when the resources could have been introduced.

Earlier reaching out to FE teachers and ILT staff and detection of 'champions' would have been better done earlier, but the whole area was very new for the UKDA. Getting acquainted with the sometimes complex navigational pathways of uncharted territory takes a little while.

Finally, we did not anticipate the need for extended checking/proofing of all materials, and the time taken to undertake promotional and outreach work.

#### 4. Project Outputs

The Final Project accompanies this Completion Report. The SDiT brochure, the final bound printed materials (Resources Pack and Tutor Guide) and accompanying CDROM, plus an example of one of the published promotional pieces from the SDiT project have been sent to Susan Eales.

#### 5. Project Outcomes

##### Main achievements and key findings

- This SDiT project created a set of well-tested repurposed learning materials based on JISC data resources marked up with appropriate metadata that aim to cover learning key quantitative research skills through investigation of substantive issues (see project outcomes for content and learning objectives covered).
- The HE and FE staff and students, and information professionals, who helped advise on and evaluate the project, considered the learning materials, the tailored data resources and the associated guides created by the project to be impressive and highly useful.
- The project was considered to have delivered a neat and flexible model that both answered the data literacy challenge in hand and demonstrated the concept of repurposing. Also, that pre-prepared materials can save teachers considerable time and effort, and also offer ideas of how to utilise data sources in their own teaching.
- Adaptation of e-learning resource by teachers is most fruitfully supported by the holders of basic resources, for example, JISC data centres. Thus high quality learning materials can be most usefully developed by getting teachers to work along side data service providers and e-learning implementers to build resources that will be available in the longer-term and that are, where possible, generic and sustainable.
- While the aim of promoting 'customisable' re-purposing is valuable, it became apparent that the production of new content was far from straightforward, requiring considerable subject knowledge and creative skill, as well as technical ability and a substantial quantity of time.
- Drafting e-learning materials takes up huge resources (time for coordinating, authoring, evaluating, rewriting mounting on web and so on), particularly if they are to be relevant, appealing, flexible, light-weight, 'discrete' rather than courseware, and suitable for web-based delivery.
- The process of deciding upon a suitable topic and authoring the material to be generic enough to answer key learning concepts yet specific enough to meet the needs of syllabi actually proved to be the most complex of the tasks.
- Involvement of tutors needs to take into consideration an extended period of buy-out of their time, but even then, the repurposing will probably require a single person to pull together the content/testing/mounting for delivery/user guide preparation/promotion and user support.
- Data service providers, such as the UKDA would be much better suited to having this type of staff available in 'permanent' positions in-house to work with teaching and learning staff who wish to repurpose collections. Relying on short-term funding means that expertise is quickly lost as fixed-term contract project staff move on. A dedicated member of staff would also be able to cover user enquiries and promotional work for the teaching and learning materials, particularly for the FE sector. It should be noted that the senior UKDA staff working on this project were all trained to post graduate level in social science and all

had research and teaching experience (methods and substantive) across the disciplines of politics and sociology. At least two of them have authored resources on research methods: Louise Corti is a RDN-VTS author for Social Research Methods and Jonathon Mulberg authored a successful book entitled, Figuring Figures: An Introduction to Data Analysis (Mulberg 2001).

- The UKDA already has years of experience of working with lecturers in the HE sector, but mostly in passive or responsive mode. That is, a teacher orders a particular dataset for teaching on their course, and the UKDA does little to service the request other than possibly to advise on the most suitable choice of data, or point to the few teaching datasets already prepared (by other teachers and then redeposited). However, user surveys suggest that even those who do request or order data (more complex data like the British Crime Survey) do not go onto use to in their teaching, due to lack of time to prepare the data, or learning materials to accompany the data. This project provided a fortuitous opportunity to collaborate with teachers and tutors to develop the pedagogic aspects of learning resources based around UKDA data was an exciting challenge.
- The project further enabled the UKDA to engage with FE level and to help appreciate better its infrastructure, IT and pedagogical concerns. Thus exploring ideas and gaining feedback about repurposing data collections for the FE community will have a pay off for ESDS and thus JISC, if resources that are 'enhanced' for educational use become popular, or even mainstream, in the future.
- E-learning aspect is still an approach that is still not still widely accepted or practiced. From the UKDA's point of view, this X4L SDiT project has enabled us to promote UKDA's existing portfolio of data and online data access tools, such as NESSTAR, to the teaching and learning communities, that will hopefully foster new interests in utilising raw data. Any further uptake of data and tools, by the teaching and learning communities would be a substantial achievement.
- Since initial scoping and evaluation played such a key role in this project, the issue of quality control comes to light. This project was thoroughly tested for its educational and learning objectives, as well as functionality and technical compliance. There should be QA processes to ensure that the content in JORUM is of high pedagogical and technical quality. Thus any resources must undergo evaluation and review and preferably be created within an informed environment that involves drawing on various areas of expertise, across pedagogy, technical development and provision, data handling and data sources and so on.
- The mapping of modules and resources to syllabi and Key Skills (levels 3 and 4) requirements for 16-18 year olds undertaken in the project was attractive to FE tutors (see Tutor Guide for mapping), suggesting that all e-learning resources should be mapped to the syllabus as precisely as possible. The investigation of crime from a sociological perspective, and the application of statistics and data handling covered in the resources address: Application of Number, Information Technology and Problem Solving, while the group exercises cover Communication. The web resources, which can be used as self-paced exercises, may further contribute to Improving own Learning and Performance.
- Teachers will find it easier to quickly identify appropriate resources that are mapped to syllabi, for example, from learning banks or repositories (such as the JORUM) for use in their own teaching. For example, being able to search say on a particular BTEC course would make the process of trying to find appropriate e-resources easier for teachers with little free browsing time on their hands.
- The writing up of case studies from the evaluations was found to be highly instructive. It provided exemplars of how to use the resources on the shop floor. Testing of all e-learning materials should produce case studies that are published for all to see. This can provide curious or more cautious teachers with a view to how others used or incorporated the learning resources.

- Working with tools as they are developing makes life difficult. The strand B projects probably should have been initiated prior to Strand A projects starting. Much time can be wasted ‘playing’ with versions that simply had too many bugs, and the same criticism goes for metadata schema development.
- Embedding strategies are required to ensure the kind of repurposed resources that the SDiT project created get promoted and publicised and used in and out of the classroom by:
  - partnership and collaboration with other bodies concerned with e-learning;
  - getting to teachers, not just ITC and e-learning staff;
  - more demonstrations and roadshows showcasing JISC repurposed resources around the regions in HEIs and colleges.

### Project outcomes

- X4L SDiT used the study of crime in society to show how existing data sources can be utilised to answer questions about crime. Crime is a popular topic taught across the curriculum, and is relevant to a range of social science disciplines, such as sociology, politics, management and general studies, psychology as well as areas such as public service GNVQ, media and citizenship studies.
- The resources created are appropriate for FE level e.g. ‘A’ level syllabi or Public Health Diploma, but are also highly applicable for undergraduate and postgraduate learning. The outputs created in the SDiT project are a variety of free teaching and learning resources relating to social science and statistics, based on learning strategies that encourage the teaching of research methods within a substantive context.
- The following resources were developed: four learning modules on the use of crime data; two appendices on sampling and statistical inference; a glossary of statistical terms, and two resource discovery guides, one on the use of the Nesstar online data exploration system, and another on how to find data and documentation (resource discovery) in the UKDA. A free dataset on crime packaged within a free data analysis software and a tutor guide to accompany these modules.
- The modules covered the following:
  - Module 1: Tracking Crime: Police Recorded Crime Figures, Trends and Reasons for Change;
  - Module 2: Theories about Crime: Public Perceptions of Crime Rates;
  - Module 2 Appendix: Crime and Political Parties, aimed at politics students;
  - Module 3: Gathering Evidence: How to Investigate Crime Statistics;
  - Module 4: Examining Evidence: How to Interrogate Crime Statistics;
  - Module 4 Appendix: Reliability of Results;
  - Module 5: Resource Discovery - Searching for Evidence: Sources of Crime Data;
  - Module 6: Guide to using Nesstar.
- Modules were designed to be used as part of standard classroom teaching or as additional/self-paced learning activities and were created in a number of formats to suit different pedagogical needs:
  - On-line, interactive self-paced modules hosted (long term) at the UKDA web site;
  - Printable and reproducible hard copies:
    - bound paper workbook with accompanying CD-ROM;
    - Microsoft Word files;
    - Adobe PDF files;
    - Microsoft PowerPoint presentations which can be used to provide slides or handouts.

- The project created new freely available teaching datasets and access to data exploration software, for which a guide to accessing them for the data handling exercises is also provided.
  - A freely available restriction-free teaching version of the **British Crime Survey** dataset available in multiple formats (SPSS, STATA, NSDStat and tab delimited (suitable for MS Excel) and available from three systems:
    - via the freely available online browsing system, Nesstar, which is freely accessed via the internet. The data can be explored directly online using very simple point-and-click procedures or the dataset can be downloaded from the site and imported into other software, such as Excel or SPSS;
    - via the UKDA download/ordering system;
    - via the NSDstat software that is available from the X4L project website or SDiT CD-ROM. NSDStat is a demonstration version of very simple and user-friendly data analysis software, which is utilised in the last two of the teaching modules were created. This is a very easy Windows-based program that enables students to examine the British Crime Survey data for themselves, and produce their own tables and graphs. This program was developed for use in schools and colleges by the Norwegian Social Science Data Archive, and is the analytical engine behind the Nesstar website, hosted at the University of Essex. A program automatically installs the SDiT teaching version of the British Crime Survey, which is greatly simplified from the full version.
  
- A tutor guide to accompany the resources was prepared comprising:
  - **Section A: Teaching and Learning Resources**
    - Introduction to the teaching and learning resources: Investigating Crime
    - Overview of the teaching and learning resources available for the use of tutors and students, including instructions for accessing the on-line files and downloading of software;
    - Synopsis of learning modules - subject areas covered, and examples of use including model answers and suggestions for classroom exercises
  
  - **Section B: Using the Survey Data in Teaching (SDiT) Materials**
    - Using data resources in your teaching, providing an exemplar/model of how such resources could be applied to other topics e.g. health, race etc
    - Model answers for Module 1
    - Key Skills mapping, a mapping of the resources to **Key Skills** levels 3 and 4, that is, appropriate to 'A' level
    - SPSS syntax for data analysis exercises
  
  - **Section C: Evaluations**
    - Case studies of using the SDiT resources, based on feedback and usage of the resources in the classroom by tutors and students;
  
- The printed materials and e-versions and links to the web have been prepared as the final output for the project as two professionally printed and bound documents and an accompanying CD-Rom. The **Resources Pack** offers: an introduction to the project and its objectives and an overview of the materials; gives a synopsis of the content of the modules and the skills that can be learned; and has the full printed versions of four teaching Modules, plus two module appendices and a Glossary of statistical terms; printed versions of two resource discovery Modules; and a guide to accessing the datasets and data exploration software. The **Tutor Guide** and a **CD-Rom** containing all the content and the data and software to access the data accompany the **Resources Pack**.

- The resources successfully span both 16-19 and undergraduate level, so that while the levels of learning are clearly demarcated, the more advanced FE students can investigate the latter modules, while many undergraduates (or postgraduates) may benefit from seeing this as a basic revision session. However, in the evaluation phase of this project, some FE level students did undertake all six modules without a problem.
- The topic *Investigating Crime* was designed to dovetail with a variety of FE and HE social science syllabi in which social research methods are often taught. In addition, the provision of a teaching version of the British Crime Survey will be of particular use in either undergraduate or postgraduate courses. The two general user guides to exploring and accessing the data collections housed at the UKDA have wider more general appeal and are less syllabus oriented.

### Lessons learned

- Embedding strategies are required to get JISC resources used on a widespread and taken-for-granted basis. There is a need to reach out to teachers on the ground, in addition to Information and Learning Technology staff, within educational institutions. This requires promotion and encouragement from organisations and policy makers in fields of education and ILT, like JISC, BECTA, LSC, and the DfES, to help utilise better JISC investments in rich resources.
- There is still little productive joined-upness between various e-learning initiatives. X4L, FDTL, NLN were found to have almost no overlap when this SDiT project was started. Towards the end of the project we noticed more visible efforts, mostly on the JISC's behalf, to try to join up. We suggest that somewhere there needs to be a centralised information portal that tells those creating e-learning resources what is going on and where. While it is not clear whether the JORUM will perform this specific activity-watching role, it might be useful.
- Repurposing requires devoted and skilled staff with complimentary skills to author the materials, pilot and convert resources to web-based media. Writing honed to appropriate pedagogic levels, and adequate technical skills are instrumental to the success of the content and learning objects created.
- Partnership and collaboration of JISC Service Providers, like UKDA, with teachers to undertake focused projects based on repurposing data resources with specific outcomes (e.g. by topic area matched to syllabus) would be beneficial. Our desire would be to see the use of such resources help build up data literacy and data handling skills amongst students, from school age and upwards.
- The major pedagogic challenges for e-learning uncovered in this project concern deriving suitable: content, interest value, comprehensiveness, complexity, sequencing, relevance and fit to syllabus and key skills, and positioning in the learning process. Other challenges further include the problems of keeping resources up to date - who will do this?
- Finally technical issues should not be ignored with possible problems of porting resources to VLEs, ensuring that web-based resources keep pace with the ever-changing web standards. On metadata matters, the work involved in having to remap resources to new evolving metadata scheme or new thesauri, should not be overlooked.
- Finally, key skills requirements mappings should be carried out for all JORUM resources.

There have not been any unexpected outcomes or opportunities, other than the amount of welcomed opportunities for promotion of the SDiT resources after the project finished, which is undoubtedly positive.

## 6. Stakeholders

The project has produced exemplar resources and a methodology/template for repurposing social science data to help teach key concepts in introductory data literacy and statistics.

The beneficiaries are:

- social science teachers, from FE to HE, up to post-graduate level;
- other teachers teaching data literacy from FE to HE, up to post-graduate level;
- students who need additional revision resources;
- e-learning implementers in institutions;
- funding bodies to find out more about the potential that data sources they sponsor can be suitable for teaching and learning in addition to research;
- other resource providers of social science data around the world who are looking for exemplars and pathways for increasing educational uses of data.

We would hope that exposure to the SDiT project resources and repurposing methodology may be seen as examples of what can be done in the area of data literacy instruction. We hope this will inspire them to create their own materials based on JISC data resources, and give them greater awareness of the potential and ease of utilising raw data held by UKDA, especially when done in collaboration with and support from data services.

The key messages are that stakeholders should:

- look further outside their own boxes and advocate and facilitate collaboration of working on e-learning projects across the UK, to help join up the activities e.g. FDTL and JISC, HE Academy and other professional organisations with educational missions, e.g. the Royal Statistical Society Educational Section<sup>1</sup>;
- orientate future e-learning programmes towards methodologies and strategies for embedding learning objects into teaching and learning practise. Case studies on how learning objects are being re-used in practise can help as can intensive promotional efforts that reach onto the shop floor. We recommend workshops and roadshows that are aimed at teachers and learners, thus preferably being discipline-based, as well as ILT and e-learning specialists.
- share best stories/practice in e-learning and repurposing, about how they are used within the learning experience via exemplars and case studies;
- recommend the sharing of modules/components instead of re-investing the wheel (including beyond the UK);
- support JISC data services financially to provide targeted support and promotion of their resources to FE. This means supporting core staff in-house to service requests from FE teachers to help undertake concrete repurposing activities and create specialist e-learning materials based on the Services' collections, and to improve data literacy in the FE sector. Dedicated activities are required to yield observable progress. Experience at UKDA/ESDS tells us that often they teachers do not have the time or even the necessary skills to do it alone. Funding must appreciate the need to buy out teacher time to author and test e-learning materials;
- provide resources for mapping e-learning resources to syllabi and Key Skills' requirements;

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<sup>1</sup> The UKDA forged some productive links with the Royal Statistical Society, who have been charged with a role in helping take forward some of the Smith Report's challenges. There is a consensus that this will require considerable investment in alternative teaching materials covering data analysis.

- encourage closer working with Examination Boards and QCA Key Skills policy makers to ensure that the work of JISC and the X4L experiences can be better implemented from a top-down directive rather than a more passive bottom up approach via ‘interested’ tutors;
- ensure the creation of useful high quality metadata. Whilst those submitting learning object metadata to JORUM can be trained and encouraged to follow rules, years of experience from creating high quality metadata for data collections at the UKDA strongly suggests that a team of cataloguers need to be on hand to help provide quality control and fill in gaps.

## 10. Intellectual Property Rights

IPR was not an overriding problem for this particular project. Overall, all the staff and tutors who contributed to authoring the materials were happy for the resources to be used without any explicit claim to IPR. The approach underpinning the creation of the SDiT materials is that tutors will wish to use the materials in a wide variety of ways, and this is part of the objective in providing a variety of formats. The material is branded as copyright free, under the Creative Commons license, which means users may freely download, copy, distribute and edit the materials for non commercial purposes. However, the guides were keen to stress that users should always cite and acknowledge official data sources properly. For example, any figures or tables produced from the UKDA copy of the British Crime Survey must be cited appropriately with reference to the Home Office and Crown Copyright. This is an important educational skill that is critical to the ability to be able to use data sources effectively, and for this reason, a section was specifically included in the learning materials on how to cite data properly.

As the UKDA have a long experience of handling license agreements for data depositors and government departments who provide regular data, the X4L SDiT project provided advice to the X4L programme by sending Susan Eales copies of the two legally agreements used by the UKDA: the UKDA Deposit Agreement (UKDA 2003); and the End User Licence Agreement (UKDA 2004). We consider that the Creative Commons and Jorum Depositor Licenses are a good idea and will be attractive to potential future depositors of new resources.

There were only four minor issues of concern to the project.

First, the resources contained some hotlinks to news articles from the Guardian Unlimited online newspaper service (Guardian Unlimited 2004). We were concerned that the service, which currently does not require either subscription or fee payment, might follow the move by the Times Online (Times Online 2004) to introduce fee paying download service for accessing archived news stories. Thus, we wrote to the Guardian Online with the aim of trying to secure permission to use (include actual text rather than hotlink) some of the news stories. The letter circulated by Susan Eales to content providers in support of the programme was enclosed but, despite repeated written attempts, a response was never received. At the time of writing this report we are still uncertain as to the future status regarding the accessibility of this service, and, as such, the hot links have simply been left in the resources.

The second issue under the heading of IPR related to definitions of key terms in social science, that we wanted to obtain from an online dictionary of research methods. Initially we were seeking a request to utilise the short pieces of text, rather than having to link to the web site resource. However, in the event the decision was taken to author our own, which although goes against the philosophy of repurposing, was easier to do for this project. It will be important for the HE and FE communities to learn more from other X4L projects’ own experiences arising out of IPR negotiation from various existing web sites.

A third matter related to getting permission to use three images of three UK Prime Ministers from an official web site in one of the modules. Permission was gained from the HMSO for re-use of the images, but extended re-use for newly created printed or web-based materials would require additional permission to be negotiated with HMSO.

Finally, the last matter concerned the matter of providing an ongoing permanent solution to hosting the X4L SDiT project resources and a longer term archival strategy. As authors, and therefore with some interest in intellectual copyright, the UKDA has always expected to host and update this resource indefinitely. The ESDS has a remit to both provide online training materials for the social science data collections it holds and to archive these in addition to the data collections. Discussion about the possible overlap with regards to housing/hosting resources with the JORUM repository will need to be clarified. Within the time frame of this project which ended in July, the position of Creative Commons was not finalised, so we would require further advice on licensing.

COPYRIGHT STATEMENT USED on SDiT CD and website:

#### Copyright and Disclaimer

© 2004 University of Essex - Copyright in these resources belongs to the University of Essex.

These resources will be licensed on a [Creative Commons \(UK\)](#) basis using the [Share Alike for UK Education](#) licence. The resources will be available from the [JISC Online Repository for \[Learning and Teaching\] Materials \(JORUM\)](#).

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## **Project Resources**

### **11. Project Partners**

Our experience from leading a project with two other partners tells us that consortium agreements are required, and that if teachers are involved, that their time be specifically bought out. Our project relied on the good will of an HE tutor who in end was not able to devote adequate time (the no. of estimated hours he had proposed at the time of the bid) to the project. As a consequence a new project officer, with an enhanced role, was bought in to take over his role in authoring the HE content.

The partnership with the FE tutor worked very well, and he delivered his work on time. His pre-established buy-out allowed him to feel a dedication to the project, without the guilt of struggling to find time for the project work within his busy and inflexible teaching schedule.

While the focus of this project was small, we collaborated with three RSCs and various institutions, such as FE colleges, who engaged in testing of the resources for us. We found that personal contact or introduction via personal contacts to be really one of the only ways of getting staff (even within our own institution) to really take any time to show interest in or engage in the project.

We tried on a number of occasions to collaborate with other X4L project that we thought were doing overlapping activities, but disappointingly, none seemed to be very interested in pursuing any further discussions.

### **12. Project Management**

A project work plan drawn up at the time of the bid, was followed and revised, only slightly, after 6 months. The project was directed, managed and coordinated by the UKDA. Bi-monthly meetings of project staff were held, and meeting with the tutors on a regular, though less frequent basis, to review plans, deliverables, consultation and evaluation strategies, and review project progress.

The first two months of the project focused on the start-up activities that included: recruitment of staff; establishing a project steering committee and key contacts; meeting with project partners to review plans, deliverables, consultation and evaluation strategies and establish timetables; drawing up a draft Consortium Agreement; attending X4L project meetings and training events; reviewing the CETIS metadata standards for X4L projects; setting up the project website to provide information about and promote the project (<http://x4l.data-archive.ac.uk>) and formulating a revised evaluation plan drawing on advice from the X4L expert evaluation workshop run by EFX. UKDA project staff always tried to attend the X4L Programme cluster meetings, events and workshops to ensure that they were keeping pace with the Programme's developments. Where possible staff also participated in relevant meetings on teaching statistics with social science data.

A project steering committee was established early on in the project, whose main role was to provide wise counsel to the project officers on the content, style and usability of the teaching and learning resources during the early developmental stage of the project. Individuals were drawn from the HE and FE sectors who had considerable teaching experience and/or experience in using the internet and other e-resources for pedagogic purposes. The committee met twice over the course of the project: October 03 and March 04. Initial 'key' contacts were also contacted early to ensure that evaluators would be in place, given the relatively short duration of the project. Having a committed and assertive steering committee is invaluable. I think a representative from one of the RSC or from e-learning centres would have been useful.

This project was fairly small in scale. It ran over eighteen months with a core team who developed, piloted, and evaluated a set of survey data-based resources, and documented the experiences, processes and outcomes of the project itself. The core team were made up of data archivists/disseminators, academics, and teachers. At any one time, no more than five UKDA staff were employed on the project on a part-time basis, other than from October 03 when the pressure of the deliverables called for a full-time project officer to undertake the burgeoning tasks of

authoring, redrafting and evaluation. Educational support was drawn from a local FE tutor, who was bought out for 20 days to help author and test materials, and a local HE tutor as an advisor. Table 1 sets out staffing compliment over the life of the project.

**Table 1**

<i>Staff</i>	<i>Department</i>	<i>Position</i>	<i>%FTE</i>
Louise Corti	UKDA	Project Manager	.2
Dr Jon Mulberg	UKDA	X4L project Officer (from Oct 03)	1
Dr Andy Wroe	UKDA	X4L project Officer (March 03 - Aug 03)	.4
Nadeem Ahmad	UKDA	Web Resources Officer	.5/.8
Jack Kneeshaw	UKDA	X4L Data Resources Officer	.2
Julie Missen	UKDA	Evaluation assistant (Aug 03 - July 04)	.1
Eric Tanenbaum	Dept Government	HE Lecturer/Learning materials advisor	5 days *
Ian Levinson	Colchester Sixth Form College	FE Tutor/Learning materials author/advisor	20 days

\*Not supported by the X4L budget, but by the University of Essex

Of the five UKDA staff on this project, only two are funded from the core ESDS grant, and the others rely on external project funding. Jon Mulberg was bought in a short-term basis and has no employment at present but is keen to be involved in any future JISC e-learning projects that the UKAD might pursue. He is a very able, and devoted to this cause of data literacy. Nadeem Ahmad's contract will finish in December 04, and again would be interested in any additional funding opportunities in the area of e-learning. Andy Wroe went on to get a full-time lecturing job in Government at the University of Kent.

### 13. Programme Support

We think the programme support could not have been better. Susan Eales, X4L Programme Manager is incredibly dedicated and showed unwavering enthusiasm and support throughout our project. UKDA project staff always tried to attend the X4L Programme cluster meetings, events and workshops, which were always found to be rather insightful. Equally valuable were the X4L email circulars on the discussion lists, the X4L and related websites (CETIS, EFX, QA Focus), which provided guidance on best practice in the areas of the JISC IE, metadata and project evaluation. The training days in evaluation were very useful, but the metadata days were found to be a bit frustrating, primarily as the meetings were very much about development and beta versions with bugs were often showcased. Thus, these days were not as productive for our staff to attend. The cluster meetings were found to be useful too, for gaining programme updates and sharing experiences. The jiscmail list was also a useful source of information.

Other projects really didn't inspire us too much, although the Northern Irish Engineering project had good ideas about liaison with examination boards. Healthy Nation were always proactive and their publicity good. I think one of problems was that mall were in the early stages of developed with little concrete outputs. It might be useful for this SDiT project to really take the time now to examine their work and findings over the next six months as the programme draws to a close to look for fruitful areas of synergy.

### *Detailed Project Planning*

#### 16. Evaluation Plan

Consultation and Evaluation were set out as a distinct work package in the bid with the following aims and objectives:

- to establish a consultation process with wider HE/FE sector in using data in teaching politics;
- to test to what extent the learning and teaching materials and associated software tools meet user needs;
- to evaluate the quality and usefulness of the learning and teaching materials and associated software tools in a practical HE and FE settings;
- to establish a feedback mechanism from students and teachers to allow users to comment on the utility and usefulness of the materials produced;
- to gain a broader feedback from a pool of teachers after the pilot;
- drawing up a list of HE politics/governments courses and tutors that will be approached for user testing;
- scoping UK networks of Politics 'A' level tutors in schools and college that will be approached for user testing;
- reviewing completed JISC project materials from 5/99 and related evaluative work conducted by JISC projects (e.g. EDNER and QA Focus) that point to best practice.

Deliverables were planned to be:

- a short report on how politics courses have used data in the classroom;
- a report on feedback gathered from the HE/FE pilots, and recommendations for further design and implementation. Including milestones, pitfalls and recommendations for implementation of this kind of resource in the classroom.

The evaluation plan was followed and the results are published: the first deliverable, the report on existing -learning resources is published on the SDiT web site and as an Appendix in the Final Report; and the second as a section in the Final Report and as structured write ups of the case studies in the final Tutor Guide. The full evaluation plan and structured feedback questionnaire developed that can be found in one of the Appendix III of the Final Report.

At the time of finalising the report on how data have been used in the classroom (July 2003) there were found to be very few widely accessible discrete modules of teaching and learning materials that are based on existing data resources in the field of social science in the UK. The JISC CHCC programme (CHCC 2003) and the pilot work for the National Learning Network (NLN 2004) were the first tranche of initiatives that were co-ordinated attempts to provide resources of relevance to the social sciences, that go beyond merely providing resource discovery. These resources should be expected to benefit those teaching at both HE and FE levels.

The report discovered that the field of political science (and even sociology) is particularly sparse in this respect, yet the SOSIG site (SOSIG 2004) lists a huge range of internet-based resources in the discipline. Similarly the excellent Virtual Training Suite (VTS) (VTS 2004) provides a good introduction to web-based resources but does not link to any freely or easily accessible data-centred resources. The VTS is also not yet being exploited by lecturers or teachers to its full capacity. There is ample opportunity for the web-based project proposed here to provide reciprocal links and promotion to these under-exploited Resource Discovery Network (RDN) resources (RDN 2004).

This early evaluation of existing resources helped define the starting point for the development of the content of the learning resources, and to ensure that the project was not reinventing the wheel. There is always the danger of that happening in the fast changing environment of e-learning.

Evaluation focused on formative evaluation via our established (some old, some new) networks of FE tutors and HE lecturers, data resources experts, and our Steering Committee. The project team was also keen to make links with existing bodies and experts with experience in creating learning materials for social scientists. The project manager set up dialogue with other X4L projects, the JISC 5/99 Project (CHCC), the LTSN Subject Centre for Sociology, Politics and Anthropology, SOSIG, the Royal Statistical Society section for statistics in education, and the RDN and VTS. Some of these showed more interest than others.

The earlier evaluation concentrated on content and sequencing and how the materials might fit a range of syllabi and courses requirements. The look and feel of the materials, in their various formats, were tested and each tranche of feedback led to iterative redrafting of the materials, creating much work for the materials coordinator and the web-author. In the later stages of the project, evaluation was largely focusing on advice and feedback from tutors but the project did engage in some limited student testing from March 2004 onwards.

It was discovered fairly early on that formative evaluation had to be of advanced prototypes. FE tutors in particular had no time whatsoever to evaluate material at an early stage of development, and very little slack to even look at and make decisions on new teaching resources. All tutor (and student) evaluation would require a near-final (beta test) product. Furthermore, the lead-in time for alteration of student course plans could be anything up to a year, so the beta-testing of the e-resources was likely to be problematic.

The Steering Committee spent considerable time on the content of the learning resources, and the material was re-drafted using their input. One particular aspect of content feedback from the steering committee that did shape the project was the need to link theory and data analysis. Data is always analysed for a reason, and data do not 'speak for themselves'. This suggested that generic data analysis resources may not work as well in FE as subject-oriented material, and also that the drafting of the e-resources would require subject knowledge.

In addition, following and suggestions from some lecturers, the materials were placed into different platforms for use in a variety of formats - paper and on-screen presentations as well as the interactive online format. This mitigated against the validity of the quantitative system-log data it was envisaged would be collected, since distributed or paper prototypes could also be used. It therefore seemed that qualitative data collection methods would be more fruitful.

The second phase of evaluation began after the redrafting of the learning resources. The materials were shown to the steering committee in a variety of formats, in addition to the demonstration version of the software. A semi-formalised evaluation was developed for this more focused exercise. The prototypes were then edited in line with the recommendations, and subsequently the UKDA attempted to find partners in colleges and universities for beta-testing. This proved difficult, as the sample population base is limited. Few tutors or students have time or inclination to take part in these evaluations. However we were significantly aided by JISC RSC promotion, and eventually were able to conduct scaled-down evaluations of the resources, which were initially beta-tested by a college in Cambridge.

After the changes from the beta-testing, the final prototype resources were then ready to be fully tested. Presentations were made at a variety of JISC events, and a workshop conducted in Cambridge University. This workshop confirmed both the content-orientation and subject-specificity of potential end-users.

Feedback was generally very positive, and tutors views and criticisms provided very useful advice on what to include in the user/tutors guides that were prepared to accompany them, so as to make them digestible and informative.

## **17. Quality Assurance Plan**

### **Web standards and software choices**

The project set up a web site within the first 2 months of the project, where basic information about the project was mounted ([x4l.data-archive.ac.uk](http://x4l.data-archive.ac.uk)). Early and ongoing liaison of the SDiT team with the web design team at UKDA helped guide and establish a design and functionality that met current W3C standards. To this end in keeping with its stated objectives for creation of online material "the UKDA/ESDS is committed to following agreed best standards and good practice in web design

and usability. The underlying code of UKDA/ESDS web sites will achieve compliance with W3C guidelines for XHTML and Cascading Style Sheets, will conform to Web Content Accessibility Guidelines, and be SENDA and DDA compliant.” (UKDA web guidelines). The X4L SDiT was created with these guidelines in mind.

As reports, learning materials and promotional materials emerged, so these were posted. The navigational structure of the website was reworked a number of times to accommodate feedback.

Early on, and through consultation, thought was given to the final outputs of the project. The team wanted to adopt an intuitive and flexible means of delivering the content of the short modules, that would incorporate sequenced web-based text and images, quizzes, but also text/print-based items. It was decided that in addition the online interactive based material, the outputs would be supplied on Word, PowerPoint and PDF, with the statistical data provided as NSDstat, SPSS and Tab Delimited data. It was noted that some of these formats were proprietary, but that this should not cause potential end users too much difficulty as the software is in widespread usage. Furthermore there is freely available software that can view the outputs of the project (for no extra cost). The project outputs were also collated for distribution as printed booklets (which were proofed to UKDA standards following the UKDA Style Guidelines), with accompanying CD-ROM, which contained all the project outputs and necessary software and data.

### **Metadata and Strand B tools**

The UKDA is committed to standards, and this was kept firmly in mind during the project. Naturally whilst it was a fundamental part of the project to ensure that metadata standards were at the forefront of the final project outputs, it was also a consideration during the creation of the Learning Objects. Equally, it was recognised from the start that at the end of the project that the Learning Objects created would be deposited in the Jorum marked up with appropriate metadata.

In the first two months of the project the team reviewed the initial CETIS metadata standards for X4L projects, based on the iIEEE standard. At the start of the project there was a great deal of discussion (both at meetings and on the CETIS-METADATA mailing list) about the metadata for the project and the development of a UKCMF (UK Common Metadata Framework), for usage of all Learning Objects (not just confined to the X4L project). The development of this would help define minimum metadata standards, with the possibility of end users being able to add comments to the learning objects (e.g. what they used the objects for) though this could affect the metadata (is it part of the metadata, and if so - what about issues over copyright, etc.).

Initially the project also assessed the two commercial tools available, Xtensis and IntraLibrary. Both tools allow upload, browsing/searching and previewing of the teaching and learning objects and associated metadata. It was also noted early on that a Strand B project (RELOAD) that would provide content packing and metadata facilities was being developed.

Of the two commercial products first tested, this seemed to be the more polished, and user friendly. All functions ran within an internet browser, which was on the whole clearly laid out and easy and intuitive to use. Rights assigned to a login ID, enabled various tasks to be performed within the repository. Browsing and searching was easy to use and the system seemed to cope well with several users are using the system at once. Again uploading either files, content packages or metadata was a simple web based process, with the facility to make amendments as necessary.

Xtensis on the other hand was found harder to use because it had two (similar looking) interfaces, a web based interface for search/browsing and previewing the learning objects and a separate control console that has to be downloaded for the uploading and editing of objects and metadata. Browsing and searching, whilst similar, was very slow due to the number of people trying to access the same information at the same time.

At the start of the project a great deal of time was spent on keeping up to date with developments in the metadata and repository. Initial testing of the strand B developments proved to be sometimes fairly frustrating given the pre-beta nature of some of them. Given these earlier frustrations, and the pressure to focus on drafting and implementing the SDiT materials and undertake the evaluation process, in the latter months of the project, it was agreed to take a more passive role in keeping

completely abreast of the strand A resource developments. However, the matter was revisited closer to completion of the project, and metadata prepared at the end of the project.

Approximately half way through the project, RELOAD was made available as a beta product and its use as a content packager was assessed for future reference, as well as its metadata input abilities. Feedback from this was passed back to the development team. Note was also taken of the transformation of the UKCMF into the UK LOM (UK Learning Objects Metadata) standard. A trial run was undertaken to package the learning objects created and input the associated metadata.

At this stage it was decided that the project would be packaged as 6 separate modules, with each module being the learning object. It was decided that breaking down the modules into further smaller component learning objects would not create any additional learning objects. Each module would be produced as a Word document, PowerPoint presentation, Adobe PDF file and an online interactive module. It was further decided that, since it was possible to denote the dependencies within the UK LOM that whilst it was possible to use each module as a standalone LO, it would be better if they were used in the order they were produced as a whole unit. Thus the metadata produced for the project eventually consisted of a description of the project as a whole, with additional metadata produced for each of the six modules created. One of the main criticisms we have of trying to add metadata to RELOAD is that the metadata fields are not numbered so that when reading using the UKLOM schema, it is hard to match the fields. Also there are no informative instructions about how to input vcard information. This only requires tweaks to the system, but they would make metadata entry more straightforward.

## 18. Dissemination Plan

The need for promoting data awareness was clear from the start of the project, thus the project built in a promotional strategy to raise the visibility of teaching-oriented datasets. Equally, alongside evaluation runs promotion, and every approach for evaluation is also promotional effort.

The project website was set up in the first two months, hosted by the UKDA, with the URL: <http://x4l.data-archive.ac.uk>.

Whilst promotion was initially based on pre-chosen collaborators within familiar territories, e.g. methods tutors, JISC centres and networks, networking and promotion to the FE sector came at a later date. Initial contacts were slow but Phil Butler from RSC London was instrumental in helping locate a keen group of London-based FE teachers who are prepared to test out the resources in 2004. From there the team made further contacts as we learnt more about the FE world. Indeed our foray into FE was a 2-way learning experience for the UKDA and for the IT staff and FE tutors within FE and Sixth Form colleges. However, once news was out, probably some 14 months into the project, we were invited to a number of RSC promotional events and e-learning fairs around the early summer time. Events attended are set out below:

### Diary of events and publicity/engagement with users Jan 2003- July 2004

- Project X4L website established
- Promotion at Essex Sixth Form Conference in Jan 2003 for local region Politics A' level teachers
- Stall and poster session at JISC Conference, 4 March 2003, Birmingham
- Talk and poster session at JISC RSC Conference, 18 March 2003, Birmingham
- Citizenship meeting, British Library, 26 May 2003, London,
- Talk, poster session at IASSIST Annual Conference, in Teaching and Learning session, Ottawa, Canada, 28 May 2003
- RSS statistics day on teaching, 26 June, Nottingham
- Flyers at ESDS Launch, London, 30 June 2003
- Flyers at MIMAS Open Forum, Manchester, 2 July 2003
- Politics Studies Association (PSA) Annual Meeting, Leicester, 23 July 2003. Links were made to appoint an advisory committee member at this meeting and flyers circulated
- Social Science Data Archives: creating, depositing and using data. Promotion of X4L project, Glamorgan, 1 September 2003, Glamorgan
- Project steering committee meeting, 13 October 2003, London

- Promotion at workshop on High quality data resources at Essex, PhD Sociology workshop, 28 October 2003, Essex
- Promotion at workshop on High quality data resources at Essex, PhD Psychotherapy workshop, 26 November 2003, Essex
- Talk on UKDA learning materials, SRA Conference - Improving the Quality of Social Research, 3 December 2003, London
- Promotion at workshop on High quality data resources at Essex, PhD Psychology workshop, 3 December 2003, Essex
- Poster & demos, ESDS Awareness Day, 5 December 2003, London
- X4L workshop with FE tutors and Philip Butler, 9 December 2003, London
- Talk, Social Science Online - The Internet for Sociology, Birmingham, 16 December 2003
- Meeting Sociology HE tutor, Essex, 9 January 2004
- Talk, ESDS Awareness Day, 6 February 2004, Belfast
- Meeting Sociology FE tutor, Braintree college, 28 February 2004
- Project steering committee meeting, 1 March 2004, London
- Leaflets at LTSN Sociology and Politics Annual Conference, 17-19 March 2004, Birmingham
- Poster at AS level Sociology Conference 23 March 2004, University of Essex
- Stall and demo at JISC Conference, 23 March 2004, Birmingham
- Social Science Online - The Internet for Economics, Business, Management and Accountancy, 25 May 2004, Bristol
- Evaluation 2 workshop with students, Hills FE College, April 2004 Cambridge
- Promotion, ESDS Awareness Day, 2 April 2004, Edinburgh
- Promotion, ESDS Awareness Day, 23 April 2004, Oxford
- Talk and Publicity, RSC Eastern, 27 April 2003, Benfleet
- Publicity, Social Science Online - The Internet for Politics, 12 May 2004, LSE, London
- Poster and publicity, Electronic Resources - Effective Integration and Marketing, 20 May 2004, Colchester Institute
- Poster, JISC Regional Support Centre for London: Resources Day, 27 May 2004, London
- Poster and publicity, IASSIST Annual Conference, in Teaching and Learning session, Madison, US, 25 May 2004
- Publicity, Learning From One Another, 16 June 2004, University of Greenwich
- Talk, hands-on and promotion, Repurposing social science data for use in teaching and learning: Crime and Social Order (X4L SDiT workshop), 21 June 2004, Cambridge
- Publicity, ESDS Awareness Day, 21 June 2004, Cambridge
- Publicity, ESRC Social Science Week, 5 events via ESDS in London
- Talk, E-learning for Sociology/Psychology: Locate, Use and Create, 26 June 2004, Sunderland
- Talk, hands-on and promotion, MIMAS Forum, 30 June 2004, Manchester
- Promotion at Research Methods Festival, 2-4 July 2004, Oxford
- User evaluation workshop, 21 June 2004, Cambridge
- Poster and publicity, ESRC Research Methods Festival, 1-2 July 2004, Oxford
- Poster and publicity, JISC RSC London Jamboree, 2 July 2004, London,
- Publicity, British Society of Criminology/ESRC Postgraduate Training Conference, 4 July 2004, Portsmouth
- Poster and publicity, Eastern Region e-Learning Fair, 7 July 2004, North Hertfordshire College
- Publicity, E-resources open day, 7 July 2004, University of the West of England, Bristol
- Talk at Statistics and Data Handling Across the Curriculum Talk, Royal Statistical Society Educational Section Meeting, 7 July 2004, Reading
- Publicity Social Policy Association, 14 July 2004, Nottingham

The UKDA publicity machine helped promote the project to international social science data and methodology circles, through conferences and email discussion lists and to government departments through representation on the Home Office's British Crime Survey Advisory Committee.

The final round of post-project publicity attracted local media attention and interest from social science teachers and more than 800 copies of the learning materials has been distributed in hard copy with CD-Rom to UK university and further education colleges. The press release, which was written with the help of the publicity Office at Essex, featured in the local papers, on the

University web site and on the National Grid of Learning news page. The publicity strategy was extensive with the projects inviting some twenty or more news outlets, such as organisational and society newsletters to publish a short piece on the project. The RSCs and HE Academies for specialist subjects all expressed enthusiasm for this to happen and the period October 2004 onwards will see the publication of articles. It is hoped that these will reach teachers as well as staff within ILT centres. The scale of the promotion was done via the UKDA, capitalising on its networks and outreach activities. The project will be continued to be promoted under the auspices of UKDA, which has agreed to host the resource, and others to follow, indefinitely.

#### Mid and end of project promotional articles

Publication	Organization
<ul style="list-style-type: none"> <li>• Press releases</li> <li>• Wyvern</li> <li>• PSA News</li> <li>• ASSIGNation</li> </ul>	University of Essex website, NGfL website, local gazette Newsletter of the University of Essex ( 3 times in 2003/4) Political Science Association The journal of ASLIB Social Sciences Information Group and Network
<ul style="list-style-type: none"> <li>• Iassist Quarterly</li> </ul>	Journal of the International Association of Social Science Information and Technology
<ul style="list-style-type: none"> <li>• Network</li> </ul>	British Sociological Association
<ul style="list-style-type: none"> <li>• Significance</li> </ul>	Royal Statistical Society
<ul style="list-style-type: none"> <li>• ALT-N</li> <li>• ESDS UKdatabytes</li> </ul>	Association for Learning Technology ESDS (3 times over 2003/4)
<ul style="list-style-type: none"> <li>• SRA newsletter</li> <li>• ATSS Newsletter</li> </ul>	Social Research Association Association of Teaching in Social Science
<ul style="list-style-type: none"> <li>• BCS Newsletter</li> </ul>	British Society of Criminology
<ul style="list-style-type: none"> <li>• Talking Politics</li> <li>• Teaching Statistics</li> </ul>	A level politics tutors The Teaching Statistics Trust
<ul style="list-style-type: none"> <li>• BSC Newsletter</li> </ul>	British Society of Criminology
<ul style="list-style-type: none"> <li>• RSC Bulletin</li> </ul>	RSC
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	RSC London newsletter
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	RSC Eastern newsletter
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	RSC Northern newsletter
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	RSC South East
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	RSC South West
<ul style="list-style-type: none"> <li>• JISC Inform</li> </ul>	JISC
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	LTSN CSAP
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	LTSN Psych
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	LTSN maths and stats
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	LTSN Health
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	LTSN Economics
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	LTSN Law
<ul style="list-style-type: none"> <li>• Newsletter</li> </ul>	SOSIG

In summary, promotion needs to be proactive and demonstrative. Passive mailing of leaflets probably doesn't gain full impact, and few teaching staff ever get out of the classroom to attend promotional events. Equally there is little incentive unless there is an institutional push to embed e-learning resources at the discipline level. During the course of the promotional work we did, we found that it was often IT staff who are nominated to attend e-learning events which is useful, but we need teachers to attend to see and be inspired by the exciting things that JISC is funding.

#### 19. Exit Plan

Metadata about resources and the non-web based resources have been submitted to the JORUM, 19 in total. Metadata records referring to URLs have been submitted, but not the resources, such as PowerPoint or Word documents.

Although an explicit exit strategy was not part of the project plan, nor a requirement of the X4L programme, it was always considered by the project leaders, UKDA, that it would be desirable to have an appropriate continuation strategy that ensures the ongoing maintenance (hosting and functionality accordingly), promotion of any resources and findings pertinent to the remit of the UKDA's longer term strategic objectives. It is harder to consider updating the content the data to reflect currency of data and trends, and it is clear that in ten years time statistical results based on 2000 data will seem rather out of date. Keeping content current is a challenge that many e-learning resources within JORUM, will need to consider. Our own feeling is that it is probably best for teachers to engage in the revision/updating process so that the learning materials meet the specific needs of their own topics taught. Where possible data services can help contribute by providing the appropriate data, but could certainly not engage in the extent of involvement that was required to create these SDiT resources.

The project director will contribute to pursue e-learning funds to create new materials based on UKDA resources, where this is considered to be beneficial to the remit of the UKDA. Through her role as Head of Outreach and Promotion of ESDS, she will also continue to give presentations on the experiences of the project and seek to foster new collaboration with educational communities and funders of e-learning initiatives.

## 20. Sustainability Plan

Although an explicit sustainability plan was not part of the project plan, nor a requirement of the X4L programme, the UKDA are aware of the benefits of making these e-learning resources available, where they can compliment the data collections it holds. The longer-term commitments are underlined under the section 19. Exit Plan. A business plan has not been written, but may be depending on the outcome of any future X4L funding applications.

Issues that have emerged that merit further investigation (see lessons learned in Section 5) include:

- JISC looking further outside their own boxes and advocate collaboration of e-learning projects across the UK, to help join up e.g. FDTL and HE Academy activities. We know there is work starting but there is a way to go. We know of 2 large scale FDTL projects working broadly in the area of statistical literacy who knew nothing about the JISC activities until we contacted them;
- sharing best stories/practice in e-learning by publishing in THES etc;
- ensuring that JORUM works with existing JISC services such as ESDS to avoid any duplication in areas, and to gain expert QA from in-house expert cataloguers and user support roles/strategies. JORUM to have skilled staff in place to undertake this work;
- providing resources for mapping e-learning resources to syllabi and Key Skills' requirements, which could be done within the JORUM scope. JORUM possibly to have skilled staff in place to undertake this work;
- a follow-on programme would be an opportunity to build on what X4L has done on repurposing and extend this to *reuse*, focusing on a single joined-up process. It would also be an opportunity to explore issues associated with buy-in and embedding at an individual and institutional level. Funding to undertake more repurposing activities must appreciate the need to buy out teacher time to author and test e-learning materials.
- JISC should also advocate and provide adequate promotional strategies that reach teachers and learners, not just ILT and e-learning specialists. This presents one of the biggest challenges and the need for community education.

- JISC to actively call on JISC service providers (like UKDA) to promote e-learning (e.g. X4L) project experiences and the specific learning materials created for projects.

If we were to propose a business plan in order to further continued productive collaboration of UKDA with teachers at HE and FE levels we would propose the following core staff, based on our experiences of the X4L project:

- one senior officer to provide reactive and proactive to support to users; help prepare data and collaboratively draft associated resources; and run promotional roadshows;
- one part-time web and metadata officer to create long-term web-based materials hosted at UKDA which meet current web standards; and to help prepare the metadata for any social science resources that were to go onto the JORUM.
- costs to cover promotional outputs and activities

## References

CensusAtSchool (2003), Nottingham Trent University [<http://www.censusatschool.ntu.ac.uk/> ]  
Collection of Historical and Contemporary Census Data and Related Materials (CHCC) (2003)  
Universities of Manchester, Leeds, Glasgow and Essex Sept 2003 [<http://www.chcc.ac.uk>]

Economic and Social Research Council (ESRC) (2001) Postgraduate Training Guidelines  
[[http://www.esrc.ac.uk/esrccontent/postgradfunding/POSTGRADUATE\\_TRAINING\\_GUIDELINES\\_2001.asp](http://www.esrc.ac.uk/esrccontent/postgradfunding/POSTGRADUATE_TRAINING_GUIDELINES_2001.asp)]

Rice et al (2001), *Report on Use of Data In Teaching and Learning*, Edinburgh University  
[<http://datalib.ed.ac.uk/projects/datateach.html>]

Smith, A (2004) 'Making Mathematics Count' (Smith 2004) [<http://www.mathsinquiry.org.uk/>]

Steen (2004) Quantitative Literacy: Why Numeracy Matters for Schools and Colleges, Quantitative Literacy: Why Numeracy Matters for Schools and Colleges, MAAOnline,

Tomlinson Report (2004) The Final Report of the Working Group on 14-19 Reform [<http://www.14-19reform.gov.uk/>]

UKDA Web guidelines [<http://www.esds.ac.uk/about/aboutthiswebsite.asp>]

## Appendix A. Summary of Project Achievements

### **Making sense of statistics: E-learning strategies**

#### **Aims**

Students across the UK are set to benefit from a project aimed at helping them to make more sense of statistics. The Survey Data in Teaching (SDiT) project aimed to consider how repurposing existing data resources supported by ESRC and JISC for teaching and learning might increase their use, while recognizing that there is considerable scope for increasing use of specially tailored teaching datasets and associated online learning materials within the FE sector. The Economic and Social Data Service (ESDS) provides access to over 5000 key economic and social data, both quantitative and qualitative, spanning many disciplines and themes.

The SDiT project was funded under the JISC Exchange for Learning (X4L) Programme and was carried out in partnership with Colchester Sixth Form College and the University's Department of Government. The X4L Programme is exploring a range of strategies, methods, tools and metadata standards that will enable the repurposing of e-learning materials. Pedagogical outcomes are at the heart of the Programme, with a focus on learning activities and outcomes, as is the challenge to elucidate strategies that will encourage sustainability and widespread adoption of e-learning materials.

Simplifying and re-purposing complex data, for example, the larger government survey datasets held by the UKDA, is one way of opening up their accessibility. A grander mission of the SDiT project was to work towards improving the data literacy of GCE 'A' level and university students to:

- enable a better understanding of the use of social science data as applied to real-life problems
- enhance skills in manipulating numerical data - textbooks, newspapers, reports and databases
- conceptualise the characteristics of quantitative data so that they can be used to support substantive arguments
- become critical consumers of these data.

Thus the focus of the content of the SDiT resources was to integrate the mechanics of data analysis with theoretical material. Data are never isolated from theory, and it is never the case that data 'speak for themselves'. The empirical orientations were thus: research methods in social science; potential of survey data to answer questions; survey measurement; sampling; basic data management/basic data analysis and resource discovery skills. Other related initiatives in this area include the CHCC project (HE level) and the more fundamental CensusAtSchool (school level) projects.

Re-purposing in the case of this project meant re-packaging complex data with educational narratives and exercises into discrete 'chunks'. Ready-made learning object or modules can be tried and tested by tutors and incorporated into their teaching in a flexible way. As a national data service provider the UKDA is in a strong position to offer its resources to the learning and teaching communities for developing more tailored resources. In turn it needs the advice and input from instructors in the classroom on how to develop the pedagogic aspects of learning resources: how to re-purpose and apply the content; where to position the resources in the learning process; and advice on the usability and functionality of the resources.

#### **Project Outputs**

The SDiT project has produced a set of free teaching and learning materials to help college and university students to understand how social science data can be used to address real-life problems. Led by the UKDA, based at the University of Essex, the project team has used real survey data from the British Crime Survey to show how this can be used to conduct research, investigate issues and, ultimately, inform public policy. Modules are available in a variety of formats, including on the internet, as PowerPoint presentations, and in printable hard-copy form, accompanied by a tutor guide. More than 800 copies of the learning materials have been distributed in hard copy with an accompanying CD-Rom to a range of university and further education colleges

in the UK. Additionally over 20 articles have been published in various educational and e-learning newsletters

The materials are designed for use in classroom teaching, or for self-paced learning activities, at A-level, undergraduate and postgraduate level. Relevant to a range of subjects, including sociology, politics, psychology, media studies and citizenship studies. The UKDA is very keen to pursue this line of repurposing work to help lecturers who are interested in applying these kinds of resources, based on national datasets, to their teaching strategies.

### **Experiences of re-purposing**

The modules for HE and FE were authored and piloted primarily by lecturers who are, or have been, responsible for teaching quantitative skills in social science (in political science and sociology). From the start, the project considered it critical that the pedagogical concerns drive the content of the resources which should then be 'translated' to the teams building and implementing the resources (extracting teaching datasets; writing NESSTAR user guides; designing and building the web interface (and CD-ROM) for the resources; undertaking evaluation activities, and designing promotional materials), based at the UKDA. The experience of working very closely in partnership with tutors also helped at the evaluation stage when rich feedback could be obtained from them trialing the resources in their own teaching. Moreover, the pedagogical aspects of the resource creation and implementation could be documented in the tutor guide and in final reports.

The greatest lesson learned from the project was that drafting such resources takes up huge resources (time for coordinating, authoring, evaluating, rewriting mounting on web and so on), particularly if they are to be relevant, appealing, flexible, light-weight, 'discrete' rather than courseware, and suitable for web-based delivery.

The HE and FE staff and students, and information professionals who helped advise on and evaluate the project, considered the learning materials and associated guides created by the project to be impressive and highly useful. Moreover, they felt that the project had delivered a neat and flexible model that both answered the data literacy challenge in hand and demonstrated the concept of repurposing. Pre-prepared materials can save teachers considerable time and effort, and also offer ideas of how to utilise data sources in their own teaching. The mapping of modules and resources to syllabi and Key Skills (levels 3 and 4) was attractive to FE tutors. In this way it would be easier to quickly identify appropriate materials from learning banks or repositories (such as the JORUM) for use in their own teaching. Case studies from the teacher and student evaluations have been written up and are published in the SDiT Tutor Guide.

Finally, it is clear from this small scale project, a toe-dipping exercise, that embedding strategies are required to get JISC resources used on a widespread and taken-for-granted basis. There is a need to get to reach out to teachers on the ground, in addition to Information and Learning Technology staff, within educational institutions. This requires promotion and encouragement from organisations and policy makers in fields of education and ILT, like JISC, BECTA, LSC, and the DfES, to help utilise JISC resources and Programme outputs like the X4L, and to help join up the many disparate e-learning initiatives. Furthermore, partnership and collaboration of JISC Service Providers, like ESDS, with teachers to undertake focused projects based on data resources with specific outcomes (e.g. by topic area matched to syllabus) would be beneficial. Our desire would be to see the use of such resources help build up data literacy and data handling skills amongst students, from school age and upwards.

For further information, please contact Louise Corti (Project Director, SDiT Project and Associate Director, UKDA, Colchester, Essex CO4 3SQ. Email: [corti@essex.ac.uk](mailto:corti@essex.ac.uk) URL: <http://x4l.data-archive.ac.uk>.