



JISC Final Report – DART DLIC project

Project Acronym	DART – Digital Anthropological Resources for Teaching
Project Title	Teaching and Learning Anthropology: Using Scalable Digital Library Platforms and Innovations in Approaches to Content.
Project Directors	Charles Stafford, Chris Fuller, and Steve Ryan (LSE) Nicholas Dirks, Kate Wittenberg, and David Millman (Columbia)
Project Coordinator (LSE) : Contact details:	Dr Caroline Ingram Room A504, Department of Anthropology, Old Building, London School of Economics, Houghton Street, London, WC2A 2AE Tel: +44 (0) 207 107 5103 Fax: +44 (0) 207 955 7603 Email: c.ingram@lse.ac.uk
Project Coordinator (CU): Contact details:	Ann Miller 507 Butler Library, MC 1103, Columbia University 535 West 114th Street, New York, NY 10027 Tel: +1 212 854 1796 Fax: +1 212 854 9099 Email: am310@columbia.edu
Date	July 2006

Caroline Ingram and/ or Ann Miller should be contacted in case of query. This report was compiled by the entire DART team. Further details about the project, and links to the digital library can be found at: <http://www.lse.ac.uk/collections/anthropology/dart.htm> - LSE page about DART and links to tools
<http://www.columbia.edu/dlc/dart/> - Columbia digital library (as well as details about DART)

Table of Contents

List the topics covered and page numbers.

Acknowledgements.....	2
Executive Summary.....	3
Background.....	4
Aims and Objectives.....	4
Methodology and implementation	4
Outputs and Results.....	12
Outcomes.....	18
Conclusions.....	21
Implications.....	22
Recommendations.....	22
References.....	23

Acknowledgements

This project was funded under the JISC/NSF Digital Libraries in the Classroom Programme (DLIC). It was a collaboration between the London School of Economics Department of Anthropology and the Centre for Learning and Teaching and Columbia University Department of Anthropology, Electronic Publishing Initiative, and the Academic Information Systems (AclS) and University Information Technology services.

The project gratefully acknowledges the support of the parent institutions.

We also wish to acknowledge the support given to us by the JISC DLIC Advisory board of “project buddies”, in particular Neil McClean and Diana Laurillard. Susan Eales was our programme manager at JISC. We would like to thank her and our fellow projects within the Programme – Spoken Word, Dialog Plus and DIDET – for their help, advice, interest and support.

Executive Summary

Summarise highlights of the project (one page), including aims/objectives, overall approach, findings, achievements, and conclusions. The full report may include technical terms, but try to keep the executive summary in plain English.

This project formed a collaboration between Columbia University and the London School of Economics. It involved the two Departments of Anthropology and drew on a wide range of pedagogical and technical expertise within both institutions. This included substantial expertise in the development and use of teaching technologies and digital libraries; in electronic publishing; in the development and evaluation of innovative teaching methodologies; and in anthropological approaches to human learning and cognition. Drawing on collective skills and building on existing infrastructures, the project focused heavily on faculty and staff development. The investigators sought to initiate a meaningful and sustainable transformation of undergraduate education and professional practice in the field of anthropology.

We worked from the premise that one of the key skills university students should acquire is how to think critically. Anthropology is particularly productive for achieving this because ethnography provides so many alternative perspectives on taken-for-granted concepts. Taking a relatively simple methodology, we have developed digital tools and resources which enhance anthropology teaching in a variety of ways – and which also have the potential to enhance teaching in other disciplines. Further we have successfully integrated research on learning technologies into the career tracks of five young anthropologists.

A further goal of the project was to develop a digital library infrastructure to store digital resources such that they could be used and recombined in flexible ways and made available for wider use. This resulted in the development of a prototype DART library at Columbia, offering the digital library research community a new model for building interfaces that offer seamless transition from secondary teaching narratives to primary digital resources, metadata, and research navigation within a digital library catalogue.

Within the LSE, through close collaboration with the Centre for Learning Technology (CLT) and the Teaching and Learning Centre (TLC), the DART project has been part of a broader process of institutional change.

We have explored the pedagogical challenges posed by the relationship between knowledge production (in this case, via ethnographic research) and knowledge acquisition (in this case, via reading ethnographies). The intention with our tool development at the LSE has been to directly address this issue to enhance the “practical” sense that our students have (both in the UK and US) – in spite of not having done fieldwork – of how anthropological knowledge is produced. In some respects, our colleagues at Columbia were less “pedagogy-led” – that is, they were (by design) less ambitious in developing digital tools for classroom use, and more ambitious in developing online resources that could (at least in principle) be used independently of any particular classroom context. As a result, they have arguably developed tools which may be more financially viable in the long term and which have a larger potential audience.

Overall, the project has had clear benefits for the LSE and Columbia units most directly involved (especially the Departments of Anthropology and the Centre for Learning Technology at the LSE) in terms of providing training opportunities, helping us with capacity building, and encouraging departmental and institutional transformation. We have developed tools which are easily modified for use in other courses/disciplines, and we are continuing to disseminate the findings of our project both in the UK and overseas.

The project also enabled both academics and learning technologists at the LSE to collaborate closely with their counterparts at Columbia University, and to learn from the very significant experience of Columbia in (amongst other things) the field of electronic publishing. More generally, we anticipate that over time the project will benefit the wider anthropological community, as well as scholars and students in other disciplines, as the lessons of our new approaches are disseminated.

The question of whether or not such development work would be possible without substantial outside subsidy is, of course, difficult to assess based on the experience of our project alone. However our intention is that the learning processes which have taken place at the LSE as a result of the DART project – thanks to the existence of external funding from JISC – will translate into long-term institutional benefits. As a result, future development work in these areas should hopefully require a smaller funding base.

Background

As a range of internet-based developments begin to mature (including virtual learning environments, digital libraries, interactive learning objects, etc.), we obviously need to integrate them more effectively into our campus-based practices. The principle objective of the DLIC call for proposals was precisely to bring about, through the use of emerging technologies and innovative pedagogical practices, a significant change in the way that teaching is carried out. This required rethinking the role of different course elements that can now be significantly enhanced by digital technologies. As Laurillard remarks, "These technologies have the potential to improve radically the way students engage with knowledge and negotiate ideas. However...the promises made for e-learning will only be realized if we begin with an understanding of how students learn and design the use of learning technologies from this standpoint" (Laurillard 2001).

Taking this perspective as a starting point, our project sought to simultaneously address two key problems. The first relates to the use of digital resources in anthropological teaching. Digital resources for anthropologists already exist in many forms; they can easily be expanded, and their use has already been explored in several research projects. For example, the Centre for Social Anthropology and Computing (CSAC) at the University of Kent hosts a selection of online anthropological materials. In general, however, anthropologists still lack both the tools and the models for integrating materials of the kinds developed by CSAC into anthropological teaching practices in meaningful ways. Dr E.L. Simpson, a research fellow at the LSE, was commissioned by the Centre for Sociology, Anthropology and Politics to undertake a critical qualitative survey of existing communication and information technology (ICT) resources for teaching anthropology in the United Kingdom. His research¹ strongly suggested that the principal difficulties encountered relate to human capital, and by extension to institutional culture. The project was therefore designed to focus significantly on issues of training, professional development, and institutional change.

The second problem is a pedagogical one, and is directly related to the nature of anthropology itself as an undergraduate discipline. (This issue has been central to the "experience rich anthropology" project, funded in the UK by HEFCE, and organized by CSAC at the University of Kent.) Modern anthropological research methods are very diverse, but the discipline still relies heavily on participant-observation fieldwork. However, undergraduate students of anthropology virtually never undertake substantial fieldwork themselves, nor would it be feasible for them to do so. As a result, although undergraduates tend to find anthropology extremely interesting, it might be asked to what extent they are truly in a position to comprehend it.

The project set out to solve how these two highly complex problems – of human capital and pedagogy – might be addressed in an integrated way.

¹ Internal report (2002)

A primary goal of the project was to explore an "apprenticeship model" for teaching anthropology in which the ethnographic research of anthropologists can be "shared" with undergraduate students through the use of digital resources and innovations in teaching practice. This approach was inspired in part by the recent work of cognitive anthropologists and others on the implications of different modes of knowledge acquisition and conceptual development (cf. Neisser 1983, Lave 1988 & 1990, Bloch 1991, Ingold 2000). For example, Jean Lave has examined the contrast between formal (explicit) instruction in classroom settings and the kind of informal (often implicit) learning that takes place "in practice" – i.e., through a process of practical engagement with real problems in the real world. Both of these forms of learning have their strengths and weaknesses, but only rarely is the latter employed in higher education. In the case of anthropology, for the reasons noted above, this may be especially unfortunate. It arguably disengages students from the fieldwork-based material they are studying and can lead them to misapprehensions about the ethnographic enterprise.

Here it should be stressed that versions of this problem – which is, in effect, the distancing of learning from the process of knowledge production – are found across a very wide range of disciplines. As a result, our intention was that this project should reach conclusions and develop models and tools that are relevant to scholars and students in a number of academic fields.

With a view to encouraging gradual and yet significant and sustainable change, our project was built primarily around the work of five Postdoctoral Fellows (two at Columbia and three at the LSE). As outlined below, they collaborated with academic staff and specialists in learning technology and digital libraries at the two institutions in the development and use of new models and resources for anthropological teaching. One aim was to make this process a central part of their professional development, and for them – in turn – to encourage the same path of professional development for others.

This project formed a collaboration between Columbia University and the London School of Economics. It involved the two Departments of Anthropology and drew on a wide range of pedagogical and technical expertise within both institutions. This included substantial expertise in the development and use of teaching technologies and digital libraries; in electronic publishing; in the development and evaluation of innovative teaching methodologies; and in anthropological approaches to human learning and cognition. Drawing on collective skills and building on existing infrastructures, the project focused heavily on faculty and staff development. The investigators sought to initiate a meaningful and sustainable transformation of undergraduate education and professional practice in the field of anthropology.

Aims and Objectives

Our aims and objectives throughout the project were:

1. To develop resources and methods which have the potential to improve significantly the teaching and learning of undergraduates in anthropology;
2. To provide a new model of professional development for young scholars in the discipline of anthropology, one that encourages the meaningful integration of digital teaching and learning into career paths and objectives;
3. To facilitate a gradual but significant process of institutional change at Columbia and the LSE, encouraging the faculty at both institutions – and elsewhere – to develop models for appropriate use of new teaching methodologies;
4. To develop technology platforms which allow for flexible, stable and effective delivery of resources and tools for teaching; and to disseminate widely the lessons learned in the development of these platforms;
5. To develop a greater understanding of the pedagogical issues involved where the process of knowledge production is detached from the process of knowledge acquisition, enabling insight not only into anthropology teaching and learning, but also into key pedagogical issues across a wide range of academic disciplines.

Methodology and Implementation

London School of Economics

At the LSE the project has been led by Professor Charles Stafford and Professor Chris Fuller (Department of Anthropology); and Steve Ryan (Centre for Learning Technology). The project was

staffed by Caroline Ingram (Coordinator), Steve Bond (Learning Technologist), Luke Freeman, Jerome Lewis and Henrike Donner (Research Fellows); with assistance from Nicola Knight (Post Graduate researcher). Project staff started at various times, but the main core was in place by August 2003.

At the LSE we worked from the premise that one of the key skills university students should acquire is how to think critically. Anthropology is particularly productive for achieving this because ethnography provides so many alternative perspectives on taken-for-granted concepts.

Our approach was informed both by pedagogic research and by our own ethnographic research into learning in a variety of contexts, including the field sites of the Research Fellows involved. These demonstrated that learning can be especially effective when embedded through actions into a social context. This is particularly pertinent to e-learning, which some educationalists consider creates environments that tend to isolate the learner from social context. Where digital learning tools were used, they were integrated into a learning environment of class-, lecture-, online- and seminar-based activities

Initially the Department of Anthropology held a meeting in September 2003 to consider the key pedagogical issues the project was to address. It was proposed that, in planning teaching, we should aim to promote critical engagement and student-centred learning, which, while increasingly under-emphasised in pre-university teaching, are central to university study. Our teaching and tools should not just package and present easily accessible and consumable nuggets of information. On the contrary, they should aim to disconcert students, forcing them to think creatively and to challenge their assumptions. Fearing that some students might feel threatened by this approach, the Research Fellows sought to create safe environments for them to experiment and try different strategies, where the students were liberated from the consequences of 'wrong' answers, until they were satisfied with the way they had for solving a problem. This appears to be a distinct advantage that digital learning environments offer to teaching over written assessment.

Two of the Research Fellows were asked to focus their efforts on one first-year course, AN102 'Reading Other Cultures'. This was because students had reported to departmental staff that they found it difficult to engage with the ethnographic monographs this course required them to read in full. Although anthropological research relies heavily on long-term fieldwork, undergraduates seldom have the chance to experience this themselves. Rather, they study cultures by reading ethnographies, which are the end result of a complex process of participation, observation, interpretation, comparison and analysis. Our challenge was to deconstruct this process for our students. This would better equip them to engage critically with the monographs and ethnographic articles they must read for their degree. It was suggested that we use our own ethnographic research in our teaching so that students and teachers could benefit from the dialogue which research-led teaching provokes. Later in the project a third Research Fellow was hired to further develop the aims of the project. As described below she concentrated on teaching course AN214, for second and third year undergraduates, and was also in a position to teach at Columbia University in the autumn of 2005.

Simply offering our students digitised materials to access from a computer terminal would not address the pedagogic objectives we had been asked to achieve, nor the criticisms of senior colleagues.

Rather than being information stores, then, our tools try to create learning journeys. Such embodied learning is often lacking from digital teaching as this is often based around information retrieval and online libraries. There is a growing problem of unmediated information overload whereby students are left free to trawl the internet cutting and pasting data without having learned the skills of discernment. What we have sought to do is teach students how to assess data critically rather than just accept it because it is there. The irony of the situation is that we have ended up designing digital learning tools that are partly aimed at redressing some of the problems created by the digital revolution in information storage.

Our digital tools created goal-oriented tasks which took the students deeper into both the corresponding texts and the intellectual challenges of doing ethnography. This approach was particularly informed by the ERA project² at the University of Kent. These innovative interactive study

² <http://www.era.anthropology.ac.uk/>

aids presented a wider range of field data than that contained in the corresponding published material; this provided learners with a fuller understanding of the material that formed the analysis in the published texts. We built on this strategy in our tools by designing assessed exercises that would force the students to engage in investigative challenges to reach an analytical goal. We would not have been able to do this without the increased speed with which computers now process information. We were conscious that re-usability and transferability are important considerations for JISC.

What's Going On?

Teaching context

The first of our digital tools simulates the experience of undertaking ethnographic fieldwork. Students experience how knowledge builds up over time and how conclusions and analysis are continually modified. It consists of a video interpretation exercise in which the student can watch a short piece of video which is enhanced by subtitles and by linked background information. At first, the subtitles and other information are consistent with the knowledge acquired by a fieldworker who has spent only three months in the field. The subtitles are therefore very incomplete, reflecting the poor grasp of language, and the additional information is similarly sparse. After watching the video as often as they like, the students are required to produce a 150-word analysis of the scene, explaining what they think is 'going on'.

This is best experienced first hand, by trying the demonstration at: <http://clt011.lse.ac.uk:8383/steve/wgo/index.html>. This exercise was built by Steve Bond (CLT) based on a piece of video filmed by (and starring!) Jerome Lewis, one of the DART Research Fellows.

A week later, after further classes and reading the corresponding ethnography, students go to Level 2. The exercise is similar to Level 1, but this time with the subtitles and information enhanced to simulate nine months' knowledge acquisition. The students submit a second, 300-word analysis in which they also reflect on any developments in their understanding. In the third week, the subtitles and information simulate 18 months' knowledge. They submit a final 600-word report. All pieces of work are assessed, and discussed in class after the end of the exercise.

The tool has been used for three consecutive years. Each year about 40 undergraduate students used the tool over three weeks of the course. The work submitted by students for the Betsileo Rice Challenge was an integral part of their course assessment.

Objectives of the tool

The aim of 'What's Going On' is to let students experience the developmental nature of anthropological knowledge – how no ethnography is ever 'complete' – and to challenge their subjectivity and cultural bias. The exercise feeds back into the reading and teaching. This helps them to question critically how the ethnographer arrived at his conclusions.

Evaluation process

Our evaluation of the exercise included a student questionnaire. One of the key questions we asked was 'What do you think you learned by using this tool?', to which the following responses were representative. The first three indicate that the tool successfully achieved some of its goals:

"The anthropologist has to constantly re-interpret what is seen, as awareness of culture and language ability increases"

"Don't make assumptions ... try and think of many possibilities not just the obvious one"

"I was able to apply what I had learned from the thesis to an actual exercise which put the reading into context"

In addition, this comment suggested a further learning outcome of the exercise:

"I think by the end of using the tool I was more aware of the nuances of Mbendjele culture than [the ethnographer] had presented in his thesis"

So here the student has gained an insight beyond that which the text affords him, by 'doing the fieldwork' himself.

Reuse and re purposing

Our learning technologist has developed an authoring tool to make it easy for other teachers to add their own video footage and corresponding text. The University of Waterloo, in Ontario, Canada, has taken and repurposed the tool for use in teaching on Chukchi reindeer herders from Siberia, within an "Introduction to Social and Cultural Anthropology course, during 2005/2006.

Betsileo Rice Challenge

Teaching context

The second phase of the 'Reading other cultures' course focuses on the Betsileo people of Highland Madagascar, which is Luke Freeman's research area. We developed an activity that problematises the standard analytic categories that anthropologists often use to present their material – economy, religion, technology etc. The task involved a simulation of growing rice and the decisions that are made daily by Betsileo farmers in trying to cultivate enough to feed their families. They decide which cultivation methods to pursue in each of their fields, as well as making decisions about the education of their children and the holding of traditional ceremonies. The model simulates the results of their cultivation, operating within a Betsileo world-view in which adherence to traditional methods and honouring one's ancestors can have as much effect on rice yields as the use of the latest farming techniques.

The game can be accessed here: <http://clt011.lse.ac.uk:8383/steve/brc/login.html>. Use the username 'guest' to log in. Again, Steve Bond (Learning Technologist) worked together with the Research Fellow, Luke Freeman, to develop the simulation.

The tool has been used for three consecutive years. Each year about 40 undergraduate students used the tool over three weeks of the course. The work submitted by students for the Betsileo Rice Challenge was an integral part of their course assessment.

Objectives of the tool

Growing the rice teaches students about the complex and often unexpected overlap between categories (e.g. "kinship" and "economics") that are often separated.

Evaluation process

Again, as part of our evaluation we asked 'What do you think you learned by using this tool?'.
"To realise that technical/practical decisions are informed culturally"

"The inter-connectedness of many of the issues - this became clear immediately."

"That the lives of different Betsileo vary hugely and their financial security, educational opportunities of their children etc depends heavily on their access to farming equipment and labour."

These tools were refined by regular and ongoing evaluation from students. In general, students were very positive both about the tools and the course as a whole. The detailed evaluation questionnaires show that our learning goals for the tools were largely achieved. However, it is hard to ascertain empirically to what extent we achieved our main project aim of increasing critical thinking. Personal observation suggests that students became more confident in the critical evaluation of texts but it does not necessarily follow that that was a result of our tools or teaching strategy. The following feedback was e-mailed to us by a student:

"Just wanted to say thanks for a great class, to you ... both. I think this was a class where I could walk in without much pressure and over and above all the content learnt, I really got a chance to engage in a critical thinking process. Like anyone, I have lots of thoughts but mine

are rarely ordered - so this class was a great exercise for that. I'll keep working on it... But just wanted you guys to know that there was much intellectual benefit to be gained."

Reuse and repurposing

There is little scope for reuse or repurposing in the case of this tool. As it stands, it refers very explicitly to the Betsileo farming culture, and it is difficult to see how this might be reused in other subject areas. Repurposing is also difficult, because the functionality of the rice-growing model is hard-coded. The way the model works is completely specific to the teaching context for which it was designed, and it seems unlikely that it would be applicable to other subject areas without significant rewriting of the code.

Kolkata Explorer

Teaching context

'Kolkata Explorer' is a tool initially developed for DART by Henrike Donner (Research Fellow) and Steve Bond (learning technologist) to support the LSE course 'Anthropology of India' (AN214), over two consecutive years. The teaching on this course consisted of 14 lectures and 14 classes over the two years. The students are 2nd and 3rd year undergraduates.

The RF later used the Explorer at Columbia University to support her guest lectures on "Modern South Asia History and Culture" (a 'Major Cultures' course). The teaching at Columbia consisted of 3 lectures and 6 seminars, over a period of three weeks.

The RF prepared the relevant lectures and classes in order to work in conjunction with the Kolkata Explorer, which was introduced alongside a WebCT course which structured the activities and provided a forum for online discussion.

During the first year, the tool was used mainly in connection with online discussions, whereas during the second year it was additionally used on a projection screen to add value and interest to formal lectures, and during classes to kick off discussions. In both years at LSE, and at Columbia, the students were also asked to produce assignments based on the content of the tool, which contributed to their assessment in the second year at LSE.

In both years, the students in AN214 were asked to follow two of the characters around the city and to produce a write-up relating to these characters. In the second year, further activities were specified which focussed on specific locations within the city.

Objectives of tool

The 'Kolkata Explorer' tool was designed to encourage students to think about the city in spatial terms, and to experience the collection of ethnographic data in an urban environment. The students roam about a map of the city, visiting key locations and examining the pieces of ethnographic evidence (texts, images, websites or video) to be found there. They can collect a self-annotated portfolio of evidence that they can use creatively in their writing, to tackle questions set by the tutor. This exercise aims to give the students experience of identifying and evaluating sources and types of ethnographic information, and puts that information into a spatial context.

This tool works on 4 main levels:

- The Explorer can be used as a personalised reader, providing assorted material and notes in an appealing and functional form. The lecturer can contextualise and interrelate materials (this is particularly true for 'raw material' such as photographs or video from the RF's own fieldwork).
- It provides a means of continuous assessment via the submission of assignments – either in the form of write-ups, or else contributions to online discussions.
- Students can be asked to conduct their own fieldwork using the resources, which can be based on a wide range of materials, while being carefully guided by the lecturer.

- Finally, the tool encourages students to develop their skills in dealing with sources, resources and media, and to find a way to utilise a variety of data – as a fieldworker would have to – because both a personal web site and a peer-reviewed scholarly article may be associated with the same location.

Evaluation strategy

At both LSE and Columbia, we measured student attitudes towards the tool and the course generally by way of paper-based questionnaires which were completed in class. In the first year, there were two identical questionnaires about the use of WebCT on the course, collected at 2 different time points to try to identify any changes in attitude during the term. A separate questionnaire covering the Kolkata Explorer was distributed at the end of term. In the second year at LSE, the general course questionnaire was dropped, and a repeated questionnaire covering the Explorer only was used. The same questionnaire was used to cover the teaching at Columbia. In addition to these data, our evaluation includes testimony from the RF on her perceptions of the success of the tool.

Re-use at Olin, future re-use at LSE

The tool has also been taken up by other lecturers for use in their respective institutions. So far it has been used in its original format at Olin College, Boston, USA. There are plans in progress to re-use the tool for teaching in the Department of Geography at the LSE – both in its original form and in customised versions covering different cities.

Criterion

Teaching Context

For this tool we adopted a different approach insofar as the academic input was largely provided by a research assistant (PhD student in the Department of Anthropology) who was recruited for the purpose on a short-term contract. Initial guidance was provided by a senior lecturer, then the process of writing content, collecting resources and developing the tool was undertaken by the research assistant and the learning technologist.

The tool was developed for use on the Masters-level course “Anthropology of Learning and Cognition” (AN437), taught over 2 terms in 2005-2006. The topic of ‘innateness’ in human behaviour and development is an important and difficult concept for students on this course. We aimed to develop an exercise which would allow students to deconstruct this concept and thus understand it more fully.

The result was an exercise called “What is innateness?” based upon a tool called *Criterion* (see Outputs section below). The exercise presents students with a grid, whose rows list twelve *phenomena* that may or may not be ‘innate,’ and whose columns list five potential *criteria* for innateness. Students work as a group to fill in the grid, by deciding whether each criterion applies to each phenomenon.

The exercise was used in teaching during the autumn and spring terms of the 2005-2006 academic year. It was introduced to the students in a special session taken by the research assistant, at which he explained the purpose of the tool and how to use it. The students were divided into 4 small groups, and each given 3 of the phenomena to investigate. In this way we hoped to spread the workload and ensure that the grid was completed and that some discussion took place for each phenomenon/criterion pair.

The exercise then ran in parallel with the lectures and classes, as something the students did in their own time. As such, it was complementary to the teaching rather than fully integrated with it. At the start of the spring term, the students were reminded about the exercise and the research assistant contributed some comments of his own to try to stimulate discussion. It had been hoped that we could hold a final session to review the completed grid and discuss the results, but the timetabling did not allow for this.

Objectives of tool

Each phenomenon in the tool is linked to a set of resources (multimedia, articles, websites, etc.) which students use, together with their course readings, to decide whether each criterion applies to that phenomenon. The tool averages these assessments of truth so that an overall choice emerges by consensus. Students justify their choices by adding comments, which appear on the page for others to read and so enable debate to take place.

Evaluation strategy

No formal evaluation of student attitudes to the exercise has yet been carried out.

Columbia University

At Columbia the DART project has been led by Kate Wittenberg, Director of the Electronic Publishing Initiative at Columbia; David Millman, formerly Director of Research and Development, Academic Information Systems (AcIS), now Director of Systems Integration, Columbia University Information Technology; and Nicholas Dirks, professor and chair, Department of Anthropology, now Vice President for Arts and Sciences. It has been staffed by two postdoctoral research and teaching fellows (Rashmi Sadana and Gustav Peebles, Department of Anthropology), a web developer (AcIS), and a project manager (Ann Millman, EPIC). All project staff were in place by the start of September 2003.

Teaching context

The pedagogical challenges of teaching anthropology at Columbia were raised and discussed at an All-Project meeting in September 2003 and in follow-up interviews that autumn with individual faculty. As the fellows hired at Columbia had no prior acquaintance with Columbia's anthropology department, it was necessary to build in a period of time for observation and mentoring. The department assigned the fellows to teach "Introduction to South Asian History and Culture" and "The Ethnographic Imagination." During autumn 2003 and spring 2004 the fellows observed these classes, interviewed faculty and their teaching assistants, and administered questionnaires to students about their study habits and learning experiences in these courses. These observations and evaluations suggested that students needed a better grasp of the relationship between observation, description, and interpretation, and more guidance and practice in drawing connections between broad anthropological and historical themes and specific cultural practices.

Based on these conclusions, in spring and summer 2004 the Fellows made decisions about how they wished to teach their courses, including what kinds of digital resources might address the pedagogical challenges they had identified. In collaboration with the rest of the DART team, they located applicable already-digital assets and had relevant materials digitized when necessary and feasible.

Building the repository

Thus the DART project built up a collection of relevant materials in several ways. We acquired and digitized materials directly from physical archives and library collections including those at London School of Oriental and African Studies Library. We acquired materials from digital libraries at the University of Chicago (using the OAI-PMH format, though currently using direct XML transfer) and from the University of Cambridge (by manual extraction from their DSpace repository); we also obtained resources from The Spoken Word project at Glasgow Caledonian University, which is working with the BBC's audio archives. These materials often arrived with basic descriptive and technical metadata. We standardized all metadata for items used in our teaching resources to achieve, minimally, Dublin Core supplemented with intellectual property rights documentation. Our rights documentation is derived from previous local work and is based on a data model consistent with rights workflow in the publishing industry. We have begun to analyze its possible expression through emerging standards such as the ODRL vocabulary.

Use in teaching

In summer and autumn 2004 the team collaborated in the development of the teaching tool for "Introduction to South Asian Literature and Culture": an online syllabus that linked directly to digital assets—primary texts, maps, photographs, timeline, video—selected from materials that had been

catalogued. DART Fellow Rashmi Sadana first taught "Introduction to South Asian History and Culture" in the autumn of 2004 using the online syllabus linked to resources from the DART catalogue plus an online discussion board, which students accessed through the university's course management system. She combined lectures with discussion during each meeting of the class and required students to post comments to the discussion board prior to class sessions. Student experiences with the course were evaluated by means of midterm and end-of-semester questionnaires. Student work was assessed during the semester by means of two essays and a take-home final exam, and Rashmi Sadana was interviewed after the semester ended.

In autumn 2004 and into the spring of 2005, the team also collaborated in the building of teaching tools for "The Ethnographic Imagination," to be taught in spring 2005 by DART Fellow Gustav Peebles. The intention of these teaching tools was to enable student exploration of the strengths and weaknesses of anthropological fieldwork. A key resource located for use in "The Ethnographic Imagination" was field notes of Christoph von Fürer-Haimendorf, an ethnographer who studied the Sherpas in the 1950s; permission for use of the field notes was obtained and arrangements were made to have a portion of them digitized. The digitization was completed in October 2004.

The digitized Fürer-Haimendorf fieldnotes were used to create three modules, one of them focusing on an aspect of the Sherpa economy, another on a religious ritual, and the third on the compilation of a house list, or village census. The economy module immerses students in Fürer-Haimendorf's methods of detailed data-gathering concerning an aspect of the Sherpa economy; it provides a basis of comparison with analytic techniques that rely less on fieldwork than on cross-cultural comparative methods. The religion module demonstrates the grounds for the post modern critique of ethnography. It presents three descriptions—from initial notes through published description—of a single ritual as viewed by Fürer-Haimendorf as well as another ethnographer's description of a similar ritual, to allow discovery of the problem of observer bias and its impact on interpretation. The field notes that are the central focus of the economy and religion modules are hyperlinked to other closely connected field materials and data, notably to entries from a village house list that Fürer-Haimendorf compiled and updated on return visits to the same field site. With the first two modules in use in the classroom, the decision was made to devote a third module to the house list, which had been digitized in its entirety, as it represents a classic ethnographic data-gathering technique and presented its own set of interpretive (and technical) challenges. Student experiences with the digital modules were evaluated by means of a short midterm writing assignment and an end-of-semester questionnaire, and Gustav Peebles was interviewed after the semester ended.

In spring 2005, the team began working on a second version of the teaching site for "Introduction to South Asian History and Culture," to be taught again by DART Fellow Rashmi Sadana in autumn 2005. Based on the feedback received from student questionnaires administered during autumn 2004 and Dr. Sadana's observations, the decision was made to augment the online syllabus-and-resources model with an interconnected timeline and additional, particularly multimedia, resources. The timeline was written, resources were located and/or developed, metadata was generated during the spring, and the revised course site was built during summer 2005.

During July and August 2005 the DART team also organized and created a web site for a new autumn 2005 course entitled "Muslim Societies" to be taught by anthropology department chairman Brinkley Messick. The site made available online scholarly resources on Islamic countries and populations, a selected bibliography of print resources, online maps, online newspapers, a selection of political, religious, and culturally oriented Islamic web sites, and photographs.

In autumn 2005 Rashmi Sadana taught "Introduction to South Asian History and Culture" once again, using the online syllabus, resources, and timeline, and Professor Messick taught "Muslim Societies" using the resources web site. In both courses student feedback about the digital resources was gathered by means of end-of-semester questionnaires, and after the semester's end both instructors were interviewed concerning their experiences.

During autumn 2005 the project has also expanded and refined the metadata attached to assets in the digital library through the development of a Definitions document and controlled vocabularies, compatible with MARC Records and Dublin Core, for a number of fields. Metadata for all DART resources is being revised where needed to conform to these definitions and standards.

Building the digital library

In January–February 2005 the team used the catalogued digital assets to develop a digital library prototype, viewable at <https://dart.columbia.edu/main/>. A simple faceted catalog interface was developed, currently implemented through XSL style-sheet processing. As the collection grows we will migrate this to a standard three-tier database application. Such technology is already in use locally for rights management and editorial workflow. The teaching interfaces to the collection, which vary based on the nature of the pedagogy, are themselves deposited into the collection.

In addition to direct user interfaces, the collection can be made available for export through web services in the METS format and METS within an OAI-PMH presentation (May 2005). We are also tracking technology developments in anticipation of additional exports, especially those that promise integration into learning management systems. For example, we have a strong interest in the ISO/IEC MPEG 21 DID standard. Also, we are following the Sakai content and library working groups toward a local development decision between a next export in either the IMS Content Packaging format or the JSR-170 Java content export interface. Our strategy is to offer the library in the most broadly interoperable ways.

While, on the one hand, the library has been built to invite interoperation, we also have restricted access to some materials, currently for licensing or archival policy reasons. In archival cases we normally refer readers to the original source material (simple link). To accommodate other restrictions we have surrounded portions of the collection within an area restricted by the Internet2 "Shibboleth" software. Within the current project, this restriction applies to materials available only to Columbia University and the London School of Economics. This technical facility had been in place since December 2004, and it has enabled students at the LSE to reach restricted materials held at Columbia. We feel this technology scales well and offers the most flexible opportunities for a publication with a wide range of both audiences and content providers.

Outputs**London School of Economics****What's Going On?***Repurposability & customisability*

The format of the What's Going On? tool allows it to be quickly and easily repurposed through the use of another piece of video. In fact this has been demonstrated during the timescale of the project when the University of Waterloo, Canada, took and used the tool successfully in a different teaching context. This has been described in detail elsewhere³.

Evaluation results

Following use of the tools in class the students each year were asked to complete a written evaluation; they also took part in group feedback sessions. The students agree that the instructions are clear, that the tool is easy to use, and that the exercise is enjoyable. They believe that the tool encouraged them to read the ethnography, and that it led to an appreciation of the difficulties of studying another culture. Overall, they agreed that it was an effective way to learn.

A majority of students found that the tool helped them understand the analysis of ethnographic data, but a significant number disagreed. The suggested improvements include a request for guidelines on how to write the reports, so it may be that students would get more out of the analysis part of the exercise if they were given some pointers before starting the exercise.

The students had a range of ideas as to the purpose of the tool, the major ones being: to appreciate the changing nature of anthropological knowledge, to appreciate the influence of language on understanding, to appreciate the difficulty of fieldwork. This is reflected in what they thought they had learned, the main responses being 'the practical difficulties of fieldwork' and 'the importance of language'.

The student response to this exercise is positive. The tool does not need modification based on these results, but the exercise may benefit from some extra instruction at the start to prepare students for the process of writing ethnography.

Betsileo Rice Challenge

Repurposability & customisability

Although it transpired that the Betsileo Rice Challenge was an effective way to teach the learning objectives, it was rather time-consuming and labour-intensive to build. This is a lesson in itself. Also, unlike What's Going On, its format does not allow it to be adapted easily to another ethnographic context. This means that it is rather tied to texts about the Betsileo. However, a lecturer in Development Studies has shown interest in using it on an undergraduate programme to highlight the cultural factors involved in agriculture in developing countries.

Evaluation results

Following use of the tools in class the students each year were asked to complete a written evaluation; they also took part in group feedback sessions. The students agree that the instructions are clear, that the tool is easy to use and that it is an enjoyable exercise. However, a slight majority did not feel that it helped them to understand the text, and overall there was only slight agreement that this was an effective way to learn.

The students gave a range of suggestions for the purpose of the tool: to learn how socioeconomic status affects rice production, to understand the life of Betsileo farmers, to appreciate the difficulties of rice cultivation and to understand the influence of different factors on rice production. The first two are what we were aiming at with this exercise, the other two are rather less so. As for what they thought they had learned, the main answers were: about rice production, about socioeconomic factors influencing rice production, about the effect of environmental factors and about the importance of balancing cultivation methods with the resources available. Only the 2nd and 4th of these are what we expected as learning outcomes.

To improve the exercise, the students suggested that more graphics were needed within the game itself, which is seen as 'too textual'. This had been addressed partially, as this feedback was received after in the first evaluation. There is also a feeling that the game does not cover a wide enough range of social issues to be really relevant to the text. They also request the option to buy more resources when things are going well for their farmer.

Overall, the students still seem to appreciate this exercise but there is some doubt from the lecturer and students as to whether it is achieving its learning objectives. The students seem to concentrate on the practical and technical aspects of the game to the detriment of its social aspects, and they feel that the social side is not well-developed. When next used in teaching, the game may benefit from a redesign to enhance its social aspects, and also to introduce a more graphical interface.

Kolkata Explorer

Repurposability & customisability

Kolkata Explorer is a Flash movie that reads in external data from separate XML files. This means that it can be completely customised with new content. Furthermore, this content can be changed and expanded as required during a course. This will be tested at the LSE in future terms as lecturers in Geography plan to use the tool to create exercises for East London and for Managua, Nicaragua.

Evaluation results

The tool was only ready for use late into the Lent term in the first year of use, and so evaluation results for that year are of limited use. The results of our evaluation refer primarily to the upgraded version used in the Lent term 2006.

In the first year at LSE, although the students were aware that the assignments would not count towards their overall marks, all but two completed the write-up in time, and the RF feels that a majority made good use of the material provided. She notes that students in both years drew largely on the class readings and the write-ups, rather than the audio-visual resources provided, although some of them commented positively on the selection of videos and pictures used. When used actively in

classes, the Explorer did stimulate student discussion, and it proved useful resource for class room teaching as well.

The student surveys revealed that the students felt the functioning of the map on which the Explorer is based should be enhanced to make navigation smoother and more enjoyable. Work has already been done to improve this aspect of the tool.

The students at Columbia are used to continuous assessment and thus reacted to the request for assignments based on the Explorer much more favourably. They are also well-versed in working with a range of visual and audio resources apart from the usual engagement with texts and were therefore more positive about the variety of resources presented. There was a 50% response to the survey, of which the majority stated that the exercise had enhanced their understanding of the topic. They made good if not very good use of the resources, and most remarked that they enjoyed exploring the visual resources as well as scholarly articles.

The Kolkata Explorer tool is best suited for courses with continuous assessment where students can use it creatively, and use the portfolio and annotation options more fully. It would be nice to include more diverse visual and audio resources, and identify some challenging way of dealing with them. It does initially demand a certain input from the lecturer, because the resources have to be identified – as for any reading list – but they have to be organised in a more complex way, namely in terms of their relation with each other. This may be seen as a challenge, but it is also a chance to rethink how we teach these kinds of courses and 'map' themes. This is also what makes the Explorer so versatile – it can be easily adjusted to be used on other courses with core themes and used to explore mental, historical and thematic maps of all kinds with the resources you choose.

Criterion

Repurposability & customisability

The output for this part of the project is the tool itself, *Criterion*, which we now describe in more detail. The tool is based on a MySQL database which holds all of the content and keeps track of student choices and comments. The interaction is provided by a set of PHP scripts, and the tool's interfaces are written in DHTML.

As we have seen, the main interface is the grid of phenomena and criteria. Each phenomenon name is a link that opens a corresponding 'phenomenon page'. This provides a description of the phenomenon, and links to a set of resources that will help the student to make decisions about the innateness of this phenomenon. There is also a list of the criteria, each of which links to a 'contribution page'. This third-level page explains the meaning of the criterion, and asks the student to decide to what extent they think it applies to this phenomenon. They are provided with a menu box to choose between options of 'true', 'false', 'probably true' and 'probably false', and a WYSIWYG editor to allow them to enter a comment, or a justification of their choice. As subsequent comments are added, they are added to the bottom of this page together with an attribution.

The previous section describes a specific use of *Criterion* for learning about innateness, but the tool is generic and can therefore be repurposed for use in other subject areas. All of the content – the lists of phenomena and criteria, the descriptions of these phenomena and criteria, and the resources that are used as evidence – all of these are stored in a database and can be changed. At the time of writing, this can only be done by manipulating the database directly, so it requires technical assistance to set up a new exercise. However, an 'administration' interface is in development, which would allow a teacher to design their own *Criterion* instances without technical help.

Evaluation results

This has not been carried out to date.

Columbia University

Findings concerning courses taught using digital resources (Columbia).

- "Introduction to South Asian History and Culture."

All Columbia undergraduates are required to take courses that focus on the world's globally influential and historically rooted cultures. "Introduction to South Asian History and Culture," an anthropology department course that fulfills this requirement, explores the 19th- and 20th-century evolution of South Asian modernity as evidenced in religious reform, nationalism, gender, and caste—key conceptual categories used by anthropologists to study culture. The course does not focus on knowledge developed through the classic paradigm of anthropological fieldwork, but rather, centers around exploration of important South Asian texts. Through the Fellows' autumn 2003 observations, interviews, and questionnaires, we learned that the course enrolls students majoring in a wide variety of subjects, most of whom do not have prior background on South Asia. The course was then being taught by means of lectures and optional discussion sessions. Students attended lectures faithfully but seldom took advantage of the discussion sessions. The professor felt he had limited means or opportunity to share with students resources on South Asia that could provide context for the primary texts they were assigned to read. Students reported relying heavily on lectures and lecture notes for their learning. It was observed by the teaching assistants that in their essays students tended to reiterate the lectures rather than venture their own interpretations. The online features that were added to the course in autumn 2004—the digital resources offered through the online syllabus and the online discussion board—were intended to provide additional context for the primary readings and more practice in analyzing and reflecting on them. The goal was not only to acquaint students with 19th- and 20th-century South Asian history and culture, but to encourage them to engage in the kinds of critical reading and critical thinking that anthropologists and other scholars employ to arrive at their conclusions.

The student questionnaires administered during and at the end of the autumn 2004 semester revealed that students interacted comfortably with the online components of the course. Most of them felt that the digital resources contributed to their learning by providing extra context and clarification for the readings. Many felt that the required posting on the class bulletin board of comments on the readings exposed them to the variety of possible responses to a text and had a positive effect on class discussion. Students' strongest suggestion was that we locate or develop further digital resources—particularly non-textual resources such as timelines, maps, additional video—that would provide additional historical background. A substantial number of them felt that their ability to analyze the primary texts and course themes would be enhanced by greater familiarity with the basic outline of South Asian history.

Rashmi Sadana, the DART Fellow who taught the course, concluded that by giving students more practice in reflecting on and writing about the material, the required posting of comments on the readings and the time devoted to class discussion made important contributions to the quality of students' written work. Overall, given the level of difficulty of the readings in the course, she was impressed with students' learning, especially as evidenced by the quality of their essays. She agreed with the students that greater familiarity with the basics of the 19th- and 20th-century history of India would increase their confidence and could enhance their ability to engage with the readings, but she was reluctant to devote a great deal of lecture time to providing this basic historical overview. Therefore for the second time she taught this course (autumn 2005) we augmented the online syllabus with a timeline in which to situate the readings. Brief biographies of major figures and definitions of key terms were also added to the online syllabus.

In the autumn 2005 course, students were responsible for three types of assignments. The first was the weekly posting of a paragraph about the readings on an electronic class bulletin board. (This was a change from autumn 2004, when students were required to post responses to the readings before every class meeting, i.e., twice a week.) Dr. Sadana found that students' postings tended to be a bit longer than those from the previous year but were similar in quality. She felt that the autumn 2004 students came to class somewhat better prepared and the quality of class discussion was somewhat better, a difference she attributes to their more frequent posting of responses to the readings.

The second assignment was to write a 5- to 6-page essay on one of the historical topics covered in the first third of the course. In addition to drawing upon the course readings and lectures, students prepared for this essay by accessing the digital timeline, which was hyperlinked to specific authors, events, readings, concepts, and dates found in the digital syllabus. This enabled students to develop a better grasp of general ideas for their essays before narrowing their topics to particular texts. The timeline allowed them to see the course narrative and specific readings within a larger historical frame, and to access specific digital resources such as video lectures, biographies, maps,

photographs, and historic radio broadcasts. Dr. Sadana found that in these essays, students were able to include relevant historical information to contextualize their analyses of course texts to a greater extent than when she taught the course in autumn 2004.

The last assignment was a longer research paper. The digital syllabus was designed to present the readings for each class meeting as a stand-alone topic in the history and culture of modern South Asia (e.g., Muslim social reform, Nehru's modernist vision, ethnographies of conjugality, etc.). To begin their research for final papers, students were asked to choose one of these course topics and delve into the readings and digital resources for that topic. Some students developed paper topics based on that initial search, while others ended up researching and writing papers that compared two of the topics; for example, one student contrasted the gendered symbolism that under-girded the 1820 debate about sati and the 1947 Partition of India.

In grading the final essays, Dr. Sadana found that the essays that explored one topic or analyzed one or two texts were similar to those she had encountered in her past teaching experiences, but that students who compared two themes or historical figures wrote much more interesting and challenging papers than she had previously received from students. She feels that the nature of their comparisons was greatly benefited by the digital resources available for this course. By the end of the course, these students were able to use the digital resources in more informed ways because they had already become familiar with the key concepts and narratives of the subject matter. They were able to search out the sources that interested them most and pair them with other sources in thought-provoking ways. For instance, one student contrasted the symbolism in Mohandas Gandhi's dress and speech with the symbolism of the Hindu nationalist RSS party. Both entities were 'nationalist,' but by combining historical knowledge and anthropological inquiry, the student was able to analyze the subtle differences between the two.

The student questionnaires administered at the end of the autumn 2005 semester confirmed that the majority of students in the class had been enthusiastic users of the online syllabus, timeline, and related digital resources. A number of them expressed appreciation for the "all in one place" aspect of the online syllabus and the presence of "related resources" that allowed exploration beyond required readings and class discussion. Students also responded very positively to the fact that the digital resources in the DART library are accompanied by full bibliographic and other information.

- "The Ethnographic Imagination."

"The Ethnographic Imagination" is a course designed to introduce students to the theory and practice of ethnography—the intensive study of people's lives as shaped by social relations, cultural images, and historical forces. The course is a requirement for all students majoring in cultural anthropology; most of the students enrolled in it are anthropology majors and most have had some prior exposure to the themes of the course. From the Fellows' observations, interviews, and student questionnaire, we learned that in spring 2004, the course was being taught by means of lectures and discussion sessions, both of which students attended regularly. The students reported relying most heavily for their learning on taking notes on assigned material, followed by lectures and discussion sections. They prepared for writing papers by reviewing readings and lecture notes; a third of the students reported drawing upon sources beyond the assigned readings, including the Internet and books not assigned for the class. But we also learned that students had trouble grasping the manner in which an ethnographic text is produced, i.e., the relationship between the data-gathering and the final book. They learned in lectures about different theories, but they never saw the theories in practice, except through the already-filtered lens of the final ethnographic text. In particular, it was not clear to students how different ethnographic approaches, as embodied in different books, actually differed in their field methodology. We also found that students remained confused about the precise difficulties and hurdles of field work. The Fürer-Haimendorf fieldwork modules created by DART were designed as antidotes to these specific problems. Each module pertains to a different "moment" in the development of methodological critiques of fieldwork and the field.

Students' experiences in using the digital modules in the spring 2005 course were explored by means of discussion sessions devoted to the Fürer-Haimendorf modules; a brief, open-ended writing assignment stemming from their use; an end-of-semester questionnaire; and an interview with Gustav Peebles, the DART Fellow teaching the course. These evaluation activities provided a number of opportunities for students to provide feedback concerning particularities of the fieldwork modules, as well as opportunities for gauging whether the modules were enhancing student understanding.

Students' strongest suggestions for improving the modules centred around making the digitized field notes easier to read, either through adding full transcriptions of all of the field notes, providing more thorough annotation of difficult-to-read or unfamiliar words and phrases, or reversing the order of presentation so that relevant passages from the published ethnography would be read before the field notes rather than afterwards (as in the original design of the modules). There were also some suggestions that we enhance the modules with more visual materials (photographs, maps, video).

Despite noting that the field materials were not easy to read, the majority of students reported via the questionnaire that the modules had enhanced their understanding of the process of doing fieldwork and the process of creating a finished ethnography. This reported gain was corroborated by student contributions to class discussions, by the quality of many of brief essays devoted to the modules, and by Gustav Peebles in his interview.

- "Muslim Societies."

Like "Introduction to South Asian History and Culture," the newly created "Muslim Societies" is an Anthropology Department course that fulfils the requirement that Columbia undergraduates take courses focusing on globally influential and historically rooted cultures. The course explores relationships between religion and society in a variety of Muslim countries and communities, extending beyond the Middle East and North Africa to consider old and new societies in South and Southeast Asia, China, Africa, Europe, and North America. The course was taught by means of lectures and required discussion sessions. From questionnaires administered in class we learned that the students enrolled in the course in autumn 2005 were majoring in a wide variety of subjects, and over half of them reported having little or no prior background on Muslim societies or religion.

Since "Muslim Societies" is a new course, we did not have the opportunity to observe the class beforehand or discuss with the professor its usual teaching challenges. Brinkley Messick was able to tell us, however, that one of his principle goals would be to guide students to the completion of an individual research project on a Muslim society, community, or group of the student's choice. At his suggestion, the web site DART developed for the course provided maps, basic reference resources for background information on countries and cultures, more specialized resources for researching specific topics, online newspapers from around the world, and Islamic cultural, political, and religious web sites, as well as visual materials related to the general themes of the course. Given the short lead time, it was not possible to ensure that by the time the site was in use all of the resources gathered there had metadata that was as complete as that attached to the resources used in the South Asia course site and the Fürer-Haimendorf fieldwork modules.

We received student feedback on the usefulness of the site via an in-class questionnaire at the end of the semester, and we interviewed the Professor Messick after the course had ended. We found considerable range in the frequency and extent to which students had used the site for their research, with over a third reporting having consulted its materials frequently, but a few claiming they had consulted the site "not at all," including one student who complained of not having been made sufficiently aware of its availability. The resources students reported using the most were the primary sources such as the online newspapers and Islamic web sites. Several students suggested that the site be reorganized around "broad topics" or geography. Others suggested that more annotation or contextualization of the sources would be useful, and a few suggested the addition of resources more directly relevant to the professor's lectures.

From our follow-up discussion with Professor Messick we learned that he had made less use of the site in his classroom teaching than he had thought he might. During the time when he had a graduate assistant locating visual materials to be included on the site he had not yet planned his lectures in detail, and later found that most of the images chosen were not sufficiently relevant to specific lectures to be useful during class. Technical difficulties and/or inexperience with the "smart classroom" in which the class was held were also factors that discouraged this in-class use. Professor Messick commented on the great diversity among the students who were enrolled in terms of their prior acquaintance with the subject matter, and the challenge this had presented in terms of lecture content. He also noted that despite a good bit of initial grumbling about the research-paper focus of the course, once students had chosen topics they seemed to find the process rewarding, and they generated varied and interesting papers. He felt that the greatest potential of a DART site to accompany the "Muslim Societies" course would be the further development of an "archival" site that would point students to the best of online resources for their independent research.

The DART team itself has drawn several general conclusions from our experience in developing digital resources for "Muslim Societies." First, it is difficult to develop well-targeted digital resources for a course that has never before been taught, as it is difficult to predict in advance what areas will be most challenging to teach and what kinds of resources may prove the most interesting and helpful to students. Second, it is important for all parties to understand the need to work collaboratively. And third, it is equally important not to underestimate the amount of lead time required to collaborate over the goals of the site and to locate, develop, and organize appropriate resources.

Findings concerning digital library construction.

The DART digital library prototype can be viewed at <https://dart.columbia.edu/main/>. This site is the initial version of the overall digital product resulting from our work. It includes teaching tools and the underlying digital library content. Portions of it are currently protected by the Shibboleth access management software as described above (under "Implementation").

Over the course of our work on the digital library infrastructure for DART, we have found both encouraging and discouraging prospects. The import and derivation process from external digital repositories presents a concern about multiple versions, accurate provenance, and unique item identifiers. For example, the OAI-PMH protocol currently carries a "provenance" field, but it does not adequately address derivative copies, common in our instructor-editor setting. "Versioning" philosophy has a long history in Library Science, and we have again raised it and arrived at yet another compromise (a new local data element); the general problem remains. Recently, the Digital Library Federation has initiated relevant projects toward the standardization of digital library interoperability (the DLF "Services Framework" and "Aquifer"). We look forward to the results of these efforts.

But also, we feel we have discovered something unique: our interfaces offer consistent links to the metadata catalogue. All teaching objects include a navigational idiom, linking back to the catalogue, offering wider exploration in a research, as well as a specific teaching tool or instructional, context. We are unaware of any other examples of digital materials (or non-digital materials) that allow such a seamless transition from secondary teaching narratives to the primary sources and their research navigation within the catalogue.

Outcomes

London School of Economics

The original aims and objectives of the DART project have been met. Specifically:

- We have developed digital tools and resources which enhance anthropology teaching in a variety of ways – and which also have the potential to enhance teaching in other disciplines.

Each of the tool development exercises at the LSE and Columbia was productive in different respects, and taught us a range of lessons. Most of our digital teaching tools (and certainly Criterion, What's Going On and Explorer) have a clear potential for use in other academic disciplines – and yet each of them addressed specifically anthropological concerns. In all cases, we have been able to experiment with the tools during undergraduate/postgraduate courses, and have therefore received substantive feedback from students over reasonable length of time on the strengths and weaknesses of everything we produced.

- We successfully integrated research on learning technologies into the career tracks of five young anthropologists.

Although it will take time to see if other anthropologists are equally keen to engage in research/development activities of this kind, we have shown that a focus on teaching and learning, and on digital technologies, is not incompatible with a research career at the highest level – especially if the funding for adequate technical/administrative support is available.

- Through close collaboration with the Centre for Learning Technology (CLT) and the Teaching and Learning Centre (TLC), the DART project has been part of a broader process of institutional change within the LSE.

More specifically, the project has encouraged not only the research fellows but also permanent members of staff at the LSE to take more seriously the benefits of using digital resources. As a result of DART, there is now a much closer working relationship between the Department of Anthropology and the relevant teaching support units in the School. By extension, lessons from our project are now being taken up by other academic units inside and outside the LSE.

- We have developed tools which are easily modified for use in other courses/disciplines, and we are continuing to disseminate the findings of our project both in the UK and overseas.

In 2006/7, dissemination activities will include a UK-wide event for all PhD students in Anthropology at which our project results will be showcased. More generally, planning for re-use of the tools outside of DART has always been one of our priorities, we have had considerable success in getting other institutions to take DART initiatives further.

- We have explored the pedagogical challenges posed by the relationship between knowledge production (in this case, via ethnographic research) and knowledge acquisition (in this case, via reading ethnographies).

The intention with each of our tool development projects at the LSE has been to directly address this issue, in one form or another, and to enhance the “practical” sense that our students have – in spite of not having done fieldwork – of how anthropological knowledge is produced.

Overall, the project has had clear benefits for the LSE units most directly involved (especially the Department of Anthropology and the Centre for Learning Technology) – in terms of providing training opportunities, helping us with capacity building, and encouraging departmental and institutional transformation. The project also enabled both academics and learning technologists at the LSE to collaborate closely with their counterparts at Columbia University, and to learn from the very significant experience of Columbia in (amongst other things) the field of electronic publishing. More generally, we anticipate that over time the project will benefit the wider anthropological community, as well as scholars and students in other disciplines, as the lessons of our new approaches are disseminated.

Columbia University

- One of the principal aims of the DART project has been to address a problem in the teaching of anthropology, as well as other fields: the distancing of student learning from the process through which disciplinary knowledge is produced.

Our objective has been to develop digital resources and teaching innovations that help undergraduate students gain insight into how anthropologists conduct research and arrive at their conclusions. We feel that the project has indeed developed digital resources and teaching methods that address this problem. At Columbia, through field work modules that exposed students to the raw data of field work and allowed them to trace its shaping into published conclusions, undergraduate students were brought closer to the method of knowledge production that is perhaps the most commonly and traditionally associated with cultural anthropology, that is, the gathering of ethnographic data in the field. The promise held by this type of resource has led us to begin researching opportunities to develop further modules based on additional archives of field materials.

The other principle model developed at Columbia was geared to a different approach to the acquisition of cultural knowledge; the syllabus-linked digital resources and timeline, coupled with required participation in an electronic bulletin board, equipped students to think about and discuss in sophisticated ways the primary texts of a globally influential, historically rooted non-Western culture. Thus undergraduates at this institution were offered opportunities to explore archival ethnographic materials and encouraged to conduct original research using high-quality, thoroughly documented primary and secondary materials online

- Another of DART's aims has been to provide a new model of professional development for young scholars in the discipline of anthropology, one that encourages the meaningful integration of digital teaching and learning into career paths and objectives.

The DART project has provided valuable teaching and research experiences for the postdoctoral Fellows. They have gained experience in analyzing the needs of undergraduate students in anthropology courses; developing ideas for making use of digital resources to enhance teaching; collaborating with other faculty, web developers, editors, and librarians; and teaching with digital resources. The Columbia/LSE partnership has also increased the Fellows' awareness of the current assumptions of cultural/social anthropologists in the two countries, and the similarities and differences between higher education in the United States and Great Britain.

Columbia has been able to extend the positions of its DART Fellows for an additional year through internal university funding. They will be working with Columbia's Committee on Global Thought in planning curriculum and academic events. We expect that there will be an opportunity for the Fellows to use the experience they have gained through their work on the DART project in developing digital materials for this program. At the time of this writing there are still many details to be worked out concerning these new positions, but we hope to be able to continue to build on the work done thus far and to extend the project's reach to additional members of the Columbia faculty.

- The DART project has aimed to facilitate a gradual but significant process of institutional change at Columbia and the LSE, encouraging the faculty at both institutions – and elsewhere – to develop models for appropriate use of new teaching methodologies.

Discussions between DART participants and members of Columbia's anthropology department faculty have encouraged a more overt consideration of teaching goals, methods, and outcomes than has been customary in the department; and anthropology faculty have been shown several new models for integrating digital resources and methods into course design and classroom teaching. But effecting measurable, long-term institutional change with regard to new teaching methodologies has proved more challenging than expected at Columbia, for several reasons. We were aware starting out that few of the faculty teaching cultural/social anthropology had shown prior interest in using newer technologies in teaching. We were not as aware of another aspect of the department that has had an impact: the extent to which it operates as a loose collection of individuals rather than as a group with a strong base of common interests and concerns. While the Fellows developed good working relationships with several permanent faculty members, there were few precedents or opportunities for them to engage with the department more generally. Also, it was felt that a demonstration of the tools and resources the Fellows had built would be the most effective way of interesting other faculty in becoming involved themselves. But given the time it took to constitute the DART team, for the team to acquaint itself with target courses in the department, and then to create and test resources for those courses, such demonstrations were possible only toward the end of the three-year funding cycle. At the very point when it became possible to engage the interest of other faculty, it has not been possible to promise the longer-term support necessary for developing further resources.

- Another goal of the project has been to develop a digital library infrastructure to store digital resources—both small units of content and more complex learning objects—such that they could be used and recombined in flexible ways and made available for wider use.

This has meant cataloguing digital assets embedded within complex learning objects so that those assets remain available for additional research, reference, or pedagogical goals.

The prototype DART library developed at Columbia fulfills this goal, offering the digital library research community a new model for building interfaces that offer seamless transition from secondary teaching narratives to primary digital resources, metadata, and research navigation within a digital library catalogue.

The DART project emphasizes both the curated quality of the library collection and the varied teaching tools that emerge from it, developed without keying production to a specific, potentially limiting authoring technology. DART's open range of original content developed within the organizational protocols of a federated archive may serve as an opportunity for basic sustainability, as well as a model of cyberinfrastructure that is easily distributed.

The DART technology plan combines infrastructure standards from the Internet middleware, digital library, learning management systems, and electronic publishing fields simultaneously, e.g., distributed access control, metadata packaging and exchange, content repository application interfaces, and intellectual property documentation, respectively. As this strategy is also relatively discipline-neutral, it may serve as a significant model for future electronic scholarly communication and education systems.

Conclusions

London School of Economics

We have shown that with significant resources (in particular for technical and administrative support and, to a lesser extent, for equipment), it is possible for research-intensive academic units to develop interesting and imaginative digital resources for teaching. Moreover, the development activities for this project were undertaken jointly with colleagues at Columbia University, thus enabling us to draw on their very different perspectives, approaches and expertise. We have shown that such a collaboration can be effective, even once the significant opportunity costs involved (e.g. in translating between institutional practices, or in coordinating across very different technology platforms) are taken into account.

The question of whether or not such development work would be possible without substantial outside subsidy is, of course, difficult to assess based on the experience of our project alone. However our intention is that the learning processes which have taken place at the LSE as a result of the DART project – thanks to the existence of external funding from JISC – will translate into long-term institutional benefits. As a result, future development work in these areas should hopefully require a smaller funding base.

It might be noted that the LSE side of this collaborative project was focused around a rather simple pedagogical issue: the disjunction between how anthropology is produced (through fieldwork) and how it is studied. This gave a relatively tight focus to much of our work, and we would recommend that in future other projects might consider adopting a similar approach – i.e. one which starts with a relatively narrow focus on teaching issues and builds from there.

In some respects, our colleagues at Columbia were less “pedagogy-led” – that is, they were (by design) less ambitious in developing digital tools for classroom use, and more ambitious in developing online resources that could (at least in principle) be used independently of any particular classroom context. As a result, they have arguably developed tools which may be more financially viable in the long term and which have a larger potential audience. Our intention during the project, of course, was that there should be synergies between the two approaches, and that we would learn from each other. So, for example, one of our Fellows spent time teaching at Columbia, using our tools, and then returned to the UK where she used Columbia-designed resources in her teaching at the LSE.

Within the Department of Anthropology at the LSE, one of the self-imposed challenges confronted by the DART project was our strong commitment to face-to-face teaching, against which digital resources are typically seen as “added value”. This meant, among other things, that assessment was sometimes not tied to the use of digital resources, and that students facing a range of demands did not always focus the attention on using them that we would have liked. (For example, while our MSc students were very interested in the Criterion tool, they were inclined to prioritise reading for seminar discussions and tutorials over independent study with Criterion – as we would have anticipated.) In future departmental use of digital technologies, questions about student work-load and the forms of assessment for non-seminar work will need to be carefully considered.

Columbia University

A clear picture of specific pedagogical challenges and goals is an important key to developing effective digital resources for specific courses. Thus it can be difficult to develop well-targeted digital resources for a course that has never before been taught, as it is difficult to predict in advance what areas will be most challenging to teach and what kinds of resources may prove the most helpful to students.

For the foreseeable future, another key factor in the success of digital initiatives in academia is likely to remain persons who are able to mediate between the intellectual and pedagogical concerns of faculty and the technology. The development of digital resources for teaching is a highly collaborative

process, a situation to which faculty—depending upon academic discipline and institutional setting—may be unaccustomed. It is important for all parties to accept the need to work collaboratively.

It is also important for all concerned not to underestimate the amount of time involved in collaboration and in locating, developing, and organizing resources and/or building learning objects that are appropriate to particular teaching goals.

Implications

Consider the future implications of your work and how others can build on it. What are the implications for other professionals in the field, for users, or for the community? What new development work could be undertaken to build on your work or carry it further?

We feel that we have shown the usefulness of digital resources for teaching anthropology, and more specifically for addressing the possible disconnection between how anthropology is done by professionals and how it is taught to undergraduate students. This theme is something on which we will continue to carry out research, and colleagues in other institutions – and in other disciplines – will also be able to build on our findings. Even at this early stage, our experience is that the tools developed have been of interest to a wide community of potential users.

In terms of changing the typical career path of anthropologists (and other academics) towards a greater involvement in development work of the kind undertaken in this project, the result is not yet clear. Among other things, we do not yet know how much significance the Fellows' work on the DART project will have for their future careers. In the U.S. as in the U.K., much emphasis is placed on the research and publication record of candidates for faculty positions, rather than on their teaching experience and interests, although the extent to which this is true depends in part on the type of institution in question. However the willingness of two high-profile institutions to support a learning-focused project of this kind is itself a useful indicator of the way in which things may be changing.

At both LSE and Columbia a number of ideas have been discussed for building on the work of DART, not least through embedding into institutional practice through continued funding (at LSE) for the next two years. At Columbia, the "Major Cultures" curriculum, an important component of undergraduate education, is currently under review, and key members of the review committee have expressed preliminary interest in the possibility of using the DART library model within this curriculum. One of the Fellows has done preliminary research concerning archives of field materials of other historically important anthropologists, as material from which to build additional modules giving students insight into the ethnographic process. There have also been several discussions between Columbia (EPIC), the American Anthropological Association, and University of California Press concerning the possibility of collaboration to augment the AAA's major portal project, AnthroSource—the major content of which is currently a number of the field's important journals—with a library of digital resources for the teaching of anthropology. Following through with these possibilities, something in which both the LSE and Columbia would be involved, is contingent upon the availability of additional funding.

Recommendations

We would recommend that JISC continue to support at least some projects such as this one which in some senses may be thought of as "risky" – because they involve international collaborations, and because they involve disciplines such as anthropology in which the potential for using digital technologies in teaching is not immediately obvious. Our results and outcomes show that with proper support such a project can succeed on a number of levels, and can facilitate development work which might otherwise never happen.

We would recommend that JISC continue to support projects which are explicitly teaching-led, i.e. which have a very clear pedagogical focus. In our case, our strong sense is that this helped us avoid the adoption of technology for its own sake.

We would recommend that when JISC supports projects involving international collaboration, careful consideration should be given to the level of support required. For our project, the budget was adequate (indeed generous). But the travel and subsistence costs required for genuine international

collaboration can escalate very quickly, especially if extended periods of overseas residence are required.

References

- Bloch, M. (1991). 'Language, anthropology and cognitive science', *Man* 26:183-198.
(Also published in Maurice Bloch, 1998, *How we think they think*, Boulder: Westview Press, pp.3-21)
- Ingold, T. (2000). *The perception of the environment: essays on livelihood, dwelling and skill*, London: Routledge
- Laurillard, D. (2001). *Rethinking university teaching: a conversational framework for the effective use of learning technologies*. London: Routledge
- Lave, J. (1988). *Cognition in practice: mind, mathematics and culture in everyday life*, Cambridge: Cambridge University Press
- Lave, J. (1990). 'The culture of acquisition and the practice of understanding', in J W Stigler et al (eds.), *Cultural psychology: essays on comparative human development*, Cambridge: Cambridge University Press, pp.309-327
- Neisser, U. (1983). 'Toward a skilful psychology', in Don Rogers & John A Sloboda (eds.), *The acquisition of symbolic skills*, New York: Plenum Press,

Appendixes (optional)

Include any appendixes that readers will find helpful to understand the work described or the results. For example, include a questionnaire if you conducted a survey, or technical details that support technical development carried out. A glossary of acronyms and technical terms is often helpful.