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What's in it for Me? Responses to Collaborative Work Space Provision in Small-Scale Pedagogical e-Research Projects

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Abstract. Organisations such as the UK's JISC (Joint Information Systems Committee) and the NSF (National Science Foundation) in the USA are pursuing ambitious plans for grid computing and the development and global deployment of an IT infrastructure to support and promote international research collaboration. Meanwhile, numerous virtual project teams struggle to work effectively with software tools ill-suited to their needs. This paper reflects on two small-scale e-research projects where participants have failed to adopt the allocated collaborative platform. In each case the expectations of these users were similar: that software would be easily available to them for which the effort of adoption was equalled or exceeded by the benefits of its use to each individual. The allocated platforms were not perceived to satisfy these requirements; hence each group resorted to alternative collaboration strategies. The barriers to CSCW use are well known but continue to evolve. This study highlights the tensions created when end-user teams demand more of their collaborative work spaces than the currently provided software can supply. It is concluded that these difficulties will continue until a platform or CSCW approach is developed, suited to small-scale e-research, which can be ubiquitously adopted.

Keywords: cyberinfrastructure, inquiry, IS strategy, pedagogical research, personal inquiry, situational analysis, teamwork, user requirements, virtual organisations

What's in it for me?

Introduction

> "The more you appeal to your whole brain, the more your whole brain will want to be in the environment. Therefore make your study [space] a pleasure rather than a prison." (Buzan, 1977 p167)

In response to funding made available to support professional standards in UK universities, the authors' home institution made a bold strategic move: rather than simply distributing the funding thinly to staff members, it chose to expand its pedagogical research capacity in order to achieve a more substantial and longer-lasting influence on academics' behaviour, on internal pedagogical strategy and on the wider research community. This has already resulted in the creation of a new research group, iPED – Inquiring Pedagogies – which is considering the technical options for communication and collaboration with internal and external research partners. A desire to select a solution which is both functionally and aesthetically pleasing (Buzan 1977) may be unrealistic on a number of levels, however, the desire to avoid solutions which actively restrict our collaboration appears, at least superficially, to be reasonable. Hence, beneficial system support for our key activities and goals are important considerations as are the avoidance of workload duplication and arcane, software-imposed procedures.

In his recent evaluation of the current status of Virtual Research Environment development in the UK, Fraser confirms that "VREs are about enabling better collaboration" (Fraser 2005, p2). This is our primary concern: in creating the new iPED research network, the authors seek to capitalise on their experience of previous CSCW initiatives with which they have been involved and to learn from others which they have observed from the outside. Like many in this and other disciplines, our aim is to host an international community of practice, CoP, (Wenger 1998) in such a way as to engage the diverse skills, curiosity and creativity of its members. We would wish our shared workspace to become the preferred virtual environment of such members, leading to successful cooperative research and to outcomes which can be fed back to our home higher education institutions (HEIs), ultimately transforming both teaching policy and teaching practice.

1. Location within the e-Research Context

This study, though influenced by global e-Research developments and the concerns of potential overseas partners, is inevitably framed by the strategic ICT developments affecting UK HEIs. It is also contextualised within our home institution's information systems strategy which in turn is in part derived from the work of the Joint Information Systems Committee (JISC). In devising the systems requirements for the iPED research network web-space, we, like numerous other similar groups globally, must also balance our desires for advanced functionality with the limitations imposed as much by the heterogeneous ICT (legacy, current and future systems, behaviours, skills and strategies) of potential collaborators as by the inevitable financial constraints.

2.1 THE LOCAL CONTEXT

As an institution with a strong and successful history of pedagogical development (*reference removed*), we have a well-embedded VLE (virtual learning environment) but no separate or integrated VRE (virtual research environment). Some interest in the collaboration and learning environment (CLE) under development by the multi-national, US-based Sakai project (Sakai 2005) has recently been expressed by the leader of our e-

Learning group. This is seen as a possible future migration path for our VLE, which could coincidentally provide VRE functionality.

Our institution's current Information Systems Strategy (Internal documents 2005) has a clear view of e-Learning and e-Administration advancement but, while acknowledging the need for document sharing and support for academic staff collaboration, has no immediate plans for the development or acquisition of appropriate e-Research systems.

Questioned regarding this institution's policies and plans for developing or obtaining systems to support research collaboration, the local director of Computing Services responded:

> "We have started looking at general collaborative tools such as Sharepoint, without as yet planning anything beyond a pilot. We are not looking specifically at research, although I am aware that collaboration with external groups is very much on the agenda. … Other tools from Microsoft might also be considered, such as for project collaboration. I am not aware of any direct linkages with e-learning." (Personal email 2005, reproduced with permission)

It can therefore be concluded that the national and international initiatives on e-Research are not sufficiently advanced to influence the current thinking of our IT Committee or its consultants.

2.2 THE NATIONAL CONTEXT

In their 2004-2006 strategy document (JISC 2003), the Joint Information Systems Committee describes a vision of the future for e-Research: "[The Grid] will have the power to fundamentally change the way in which researchers across the world undertake their work, in much the same way as the Internet has changed the way the working world operates" (JISC 2003, p. 7). This report depicts a future systems environment comprising e-Research, Digital Library, e-Learning and Management Information Systems elements all making use of shared content, supported by a common information environment, delivered via common middleware and connected through a common network (JISC 2003, p. 10). The JISC strategy document also indicates that these elements are the responsibility of six JISC sub-committees:

- JISC Organisational Support
- JISC Content Services
- JISC Integrated Information Environment
- JISC Learning and Teaching
- JISC Networking
- JISC Support of Research (JISC 2003 p 18)

Although divided between these committees, the overall vision of integration remains a priority: "helping institutions integrate their research, learning and teaching and administration processes" (JISC 2003, p. 2). User expectations of pervasive computing are also recognised: "accessible when and where required" (JISC 2003, p. 9).

One step towards implementation of JISC's VRE strategy has been the creation of the 2004-2007 Virtual Research Environments (VRE) programme (JISC 2004, JCSR VRE Working Group 2004), which involves a widely representative range of projects. Although these are largely discipline-based, at least one educational research project is included – hosted by Cambridge University's Centre for Applied Research in Educational

Technologies (JISC 2005a). This, along with the VRE Portal Demonstrator project (JISC 2005b), provides links to international VRE developments within the Sakai project. Progress on the VRE programme is reported via the JISC website, with a number of associated events restricted to invited participants only.

While the JISC VRE programme is intended to help clarify the VRE concept and demonstrate the issues of concern, it does not intend to produce a finished product: "A VRE will provide a framework of resources to support the underlying processes of research on both small and large scales" (JISC 2004, p 1). (We note that the definition of 'small' and 'large' is not clear from the documents available.)

It is also unclear whether there is any support for collaborative research processes beyond searching for partners and conducting systematic literature reviews. The framework may well provide greater access to more published resources, for a wider range of purposes, and enable networking amongst potential collaborators, but not necessarily assist the shared working and necessary cooperation at a range of public and private layers whilst conducting the research (for example, external-facing or internal to the project).

2.3 THE INTERNATIONAL CONTEXT

In formulating its strategy for the creation of "a broad-based eInfrastructure for research" (JISC 2003, p. 7), JISC drew on the work of, and their previous collaborations with, the National Science Foundation (NSF) in the US which had already identified the need for investment in cyberinfrastucture (NSF, 2003) to enable effective super-computing global collaborations, for example in astronomy and biomedical research.

The NSF premise the need for global cyberinfrastructure on their desire to avert "increased fragmentation and balkanisation of the research communities" (NSF 2003 p 2). This meliorist objective has already lost ground: the creation of mutually antagonistic research groupings is an unfortunate result of initiatives such as the UK Research Assessment Exercise (www.rae.ac.uk) which seek to identify the 'best' groups in each research discipline as defined largely by their inputs (funding awarded, staff involved) and outputs (publications achieved and the comparative 'impact factors' of the journals or conferences targeted). Becher noted the beginnings of such commoditisation of academic research in his influential work, *Academic Tribes and Territories:* "The competitive nature of academic life is a function of the emphasis placed on gaining a professional reputation" (Becher 1989 p 91).

The tensions between research groups are considered by Sugden in his discussions of the internationalisation of universities and frameworks for their cooperation. Whilst acknowledging that "in reality people might see themselves as rivals" (Sugden 2004, p116) and asserting that "access to funding often relies on joint submission from a set of academics based in different institutions" (Sugden 2004, p115), he recommends that research groups remodel themselves as small businesses using a multinational 'web' of research stakeholders to facilitate cooperation and collaboration. He cites *L'institute* (www.linstitute.org) as a working prototype. From 1997-2005, *L'institute* ran as a joint venture between faculty in the UK, Italy and the US aiming "to stimulate dynamic networking using research projects, learning programmes and discussion forums" (Sugden 2004, p127). It has now been replaced by www.postgradschools.net which claims to be building on the success of *L'institute:* "a global learning community is being evolved in order to take the multinational networking activities to their next stage" (Postgradschools 2005). The transition from a URL with an academic suffix, to a 'charitable' one and now to a commercial URL is indicative that the 'small business' model may well have been successfully adopted in this case.

Sugden further proposes a range of characteristics for such a multi-partner 'web', the most interesting of which would be the "means to recognise, highlight and resolve conflicts and tensions" since "rather than suppress[ing] this rivalry by holding it in place within a hierarchy, a web pulls it out through engagement and involvement" (Sugden 2004, p116). This notion of a web of small businesses as a model for academic collaboration will be revisited later.

2. Scope and Relevance of the this Study

In order to explore the gap between national and global e-Research strategy and the practice of small-scale e-researchers, we will proceed to consider two case studies. Our further objective is to gain a deeper understanding of the goals and interactions which arise within such projects and the extent to which the allocated VRE software was perceived by participants as supportive and/or restrictive. From these findings we propose to establish a set of provisional system requirements for a VRE to support our own research network (iPED). Our focus is therefore on small-scale, pedagogical research. Colleagues working in other disciplines may, however, find this study illuminating as we consider our requirements to be not untypical of other collaborative research of which we are aware.

3.1 DEFINITION OF 'SMALL SCALE' IN THIS CONTEXT

In order to understand the way in which we are using the term 'small-scale', it is pertinent to outline the nature of our research activities. Members of the iPED research network undertake a variety of research activities. At one extreme, some of our research work is carried out by individuals working alone. At the other extreme, we work on funded projects with numerous partner organisations each hosting small groups of individuals (normally between one and ten people) per partner. A key aspect of these funded projects is that the timescales involved are short, with typical durations of eighteen to twenty-four months. Most often, we work together in small groups of between two and five people (for example as PhD supervision teams or in mini-projects for a particular purpose – such as writing this paper) with group members dispersed locally, nationally or internationally. Furthermore, there are three growing dimensions to our work; firstly working individually as mentors to other individuals within our own institution, secondly as individual or paired consultants to small groups of colleagues and thirdly as consultants to external organisations.

Thus our use of the term 'small-scale' relates both to the numbers of individuals involved in any one partner organisation for any given research project or activity, as well as to the duration of these projects and activities. Our study does not set out to comment on the VRE requirements or experience of 'large scale' research either in terms of large numbers of co-located researchers, or as research projects with extended durations.

Perhaps a parallel could be drawn arising from Sugden's notion of networks of small businesses discussed earlier. We suggest that, just as the contrasting needs of large commercial corporations and those of SMEs (small and medium-sized enterprises) are well understood in systems design and other provision, so the needs of small-scale research should be differentiated from those of large-scale research (e-Science).

3.2 IMPLICATIONS OF PEDAGOGICAL RESEARCH

The JISC conception of an environment where e-Research and e-Learning coexist alongside digital libraries has particular appeal to the pedagogical research community as

we seek to "harness the Internet to foster the nexus [of research and teaching]" (Jenkins et al 2003, p160). Our interest extends beyond the traditional integration of these elements whereby research informs and underpins teaching. It also concerns delivery modes which use iBL (Inquiry Based Learning) – that is, problem solving, project work and other inquiry-based approaches – to enrich the student experience; together with more wide-ranging policy-related and practice-related pedagogical inquiry. We differentiate 'PedD' (Pedagogical Development) from 'PedR' (Pedagogical Research) but at the same time would like to integrate them. For example, it would be beneficial if both staff and students shared the same virtual research environment; similarly, students would benefit from using the same learning environment for both taught and research-based modules. Hence the Internet is seen by many within our area as the means of drawing together PedD and PedR: these often separated strands of academic life.

3. Selection and Analysis of Sample Projects

Two projects have been selected for analysis as illustrative examples. They provide demonstrations of interaction which are representative of other e-Research projects of which we are aware at local, national and international levels. We consider these case studies to be instructive both in our search for appropriate e-Research support infrastructure, and in generating hypotheses concerning e-Research which could be tested in subsequent larger-scale surveys in this area.

Each of the two selected projects was externally funded, involved a wide range of European partners, ran over a fairly short timescale (two years or less) and focused on eLearning. Despite the CSCW difficulties experienced, each project was largely successful in achieving the outcomes for which it was funded, however, the projects have been anonymised since our analysis has been conducted retrospectively, and was not a feature of either original bid. These projects have been classified as 'small-scale' in terms of their duration and the small number of participants from each partner organisation.

The focus of the projects on e-Learning may mean that the majority of participants were rather more technically skilled and more motivated to work collaboratively online than is the case for e-Research projects in other disciplines. Our finding that these participants found the allocated software to be both alien and unwieldy is therefore significant. Equally, the very paucity of online communication achieved at key stages of each project is telling.

4.1 ANALYSIS APPROACHES

We have selected two complementary analysis approaches, the ordered situational map (Clarke 2005) and personal inquiry (Mann 2003). These 'low-intensity' processes allow us to move flexibly between low-level and high-level issues, and provide a framework through which to generate theoretical explanations from personal observations.

Clarke's variant of Situational Analysis (2005) (which drew on the grounded theory of Glaser and Strauss) has been adapted to give a clearer view of each project context. Situational Analysis encourages a deeper understanding of a case study through consideration of the many influences and facets that categorise that particular situation. Rather as is the Rich Picture technique used in the Soft Systems Analysis approach, a 'messy' situational map may first be assembled which represents as many relevant features as possible. This is then reviewed and an ordered situational map derived, identifying the most interesting characteristics (perceptions, interpretations and issues arising) which can be taken forward for further consideration as a 'social worlds/arenas'

map, as a positional map and so on. In this study we limit ourselves to an adaptation of the ordered situational map.

Personal Inquiry has been used as a means of critical reflection on the key characteristics of each case. As discussed in Mann (2003 p 113) it provides a means to combine the participant and observer roles, thereby gaining both "personal understanding and research purpose, and form[ing] a framework within which to further investigate the issues raised outwith the realm of the personal". This process therefore provides insights into a particular situation from an individual's own standpoint rather than a generally applicable analysis. However, we find that these 'inside-out' views of the case studies to be illuminative.

4.   Case Study 1: A French-managed Project

This European-funded project involved academic and commercial partners from a wide range of EU countries. It ran from October 2003 until September 2005 and, at the time of writing, is creating its final report. Its purpose was to trial a set of eLearning tools and approaches with students from a range of HEIs using the input of SMEs. Virtual collaboration was supplemented by four full-group face-to-face meetings held over the two- year lifespan.

One of the authors (*name deleted*) acted as a passive project observer for part of the project and as an active project participant over a sixteen month period, having access to project communication media throughout. These reflections and case study review were undertaken after the completion of the project using web access, project documentation and personal notes taken in situ.

5.1 SITUATIONAL ANALYSIS

Table 1 Ordered Situational Map of the French Managed e-Learning Project (after Clarke 2005, p90)

Individual Human Elements/Actors	Nonhuman Elements Actors/Actants
▪ Project Manager ▪ Facilitator ▪ Project Administrator ▪ Academic Project Team Members from a range of EU countries ▪ Commercial Project Team Members from a range of EU countries (Project team evolved over the course of the project, with up to thirty-four participants from thirteen organisations)	▪ Email with MS Office attachments used throughout the project (Word, Excel) ▪ WebCT (Discussion Forum, File Management, Mail, Chat) adopted as the project management and team collaboration tool after the first 6 months ▪ Project plan derived from original bid Work Plan ▪ Reporting processes adopted as required by the funding body
Collective Human Elements/Actors	Implicated/Silent Actors/Actants

▪ Project Sub-Committees: Steering Group, Communications Committee, Technical Committee, Pedagogy Committee ▪ Funding Body ▪ Host HEI Senior Management ▪ Partner University Accounting Departments ▪ Partner SMEs ▪ Host HEI WebCT Administration Team	▪ Partner HEI associated research groups ▪ Project team members' 'real jobs' from which they had been seconded (or not) ▪ Attendees at project team's dissemination activities (workshops, conferences) ▪ Future Funding Body Applicants
Discursive Constructions of Individual and/or Collective Human Actors	*Discursive Constructions of Nonhuman/Silent Actants*
▪ Lack of 'pull' from the 'VRE': "What's in it for me?", "there's nothing there", "you never reply" ▪ WebCT as a burden "we haven't been trained", "it makes Adobe crash", "please make some postings" ▪ Unreliable electronic communications "not everyone received the email" ▪ WebCT as a barrier to collaboration "I can't even sign my own name on a posting", "WebCT's not working", "We should improve communication between the partners"	▪ "Project team members seen as delinquent in their 'real' jobs ▪ Project activity seen as unrelated to work of partner HEI associated research groups ▪ WebCT as the primary repository not enforced by project manager and little-used by project administrator ▪ Duplication of communication mechanisms (telephone and email used to reinforce forum postings – and vice versa)
Political/Economic Elements	*Sociocultural/Symbolic Elements*
▪ Conflicting views on the best VRE options ▪ Rejection of solutions not personally known to key stakeholders ('not invented here') ▪ VLE support team offered WebCT as VRE ▪ Lack of a ubiquitous e-Research platform enforced adoption of 'least worst' VRE solution	▪ Non-active team members as delinquent "I'm all alone here" ▪ Use of French, English (or both) by team members for informal postings ▪ More photographs of group events posted than text messages in one web
Temporal Elements	*Spatial Elements*
▪ Conflicting pressures on team members from home organisations ▪ Time-zones – Across the range of European participants (little impact)	▪ Geographic dispersion of partner organisations ▪ Isolation of team members within some partner organisations
Major Issues/Debates *(Usually Contested)*	*Related Discourses* *(Historical, Narrative and/or Visual)*
▪ Use of an e-Learning platform to support e-Research ▪ Evidence of participation through forum postings valuable in itself ▪ Project management and facilitation through separate roles ▪ 'Foreign' languages as barriers to communication	▪ "State of the art technology?": Cyberinfrastructure vision of global research network ▪ Partner information systems strategies address VLEs but not VREs ▪ International, multi-institutional projects a requirement of funding
Key Events/Features in Situation	*Formal Actions taken to resolve difficulties (additional category)*
▪ Little WebCT project team interaction between face-to-face meetings ▪ Some lack of understanding of project manager's expectations ▪ Non-optimum WebCT set-up interfered with communication	▪ Additional webs created for each sub-committee to focus participants ▪ Project facilitator reinforced PM instructions by email or via WebCT ▪ WebCT worked around – email and phone used as first preference

What's in it for me?

5.2 SELECTED KEY ISSUES EXPLORED THROUGH PERSONAL INQUIRY

1. Use of an e-Learning platform to support e-Research

The adoption of WebCT as the VLE was decided by a sub-group meeting at the host HEI at the start of the project, largely because of its availability to the technical support team and status as a known solution. I perceived its adoption as the VRE to be a convenience which satisfied the bid's stated the intention of using an 'Internet forum' to support inter-partner dialogue. No allowance was made in the budget to acquire a VLE or a VRE (though funds were redirected from elsewhere in order to pay the WebCT licence fees), nor was allowance made for partners to be trained to use the software.

As an early adopter of WebCT at my own institution, I needed no training and was happy to try to use it as a collaboration platform. I could see the benefits of having a shared VLE and VRE to partners delivering and evaluating distance learning. I knew that WebCT would be far from perfect in this role, but it could have provided most of the simple functionality this particular project required.

A difficulty arose in communicating with the WebCT support team as their English and our French were insufficiently subtle to discuss and resolve technical problems. For example, they gave the project manager shared 'Designer' status on each web with one or more other people and thus fell foul of a glitch in that release of WebCT whereby all postings from any Designer appeared to come from the same person and none of them was alerted to each others' new postings. This problem could have been resolved in a number of ways, but was not. The relatively small income to my HEI from the project meant that I had many other pressures and priorities from my day-to-day job and so lacked time to pursue these issues.

The creation of new webs rather than additional public or private groups within the primary web was another WebCT support team decision which created rather than reduced difficulties. Again, these problems could have been resolved if communication between the experienced WebCT users and the support team had not been problematic. The project interim report suggested that WebCT itself was at fault whereas I felt these were set-up problems due to inexperience and language barriers.

Several project team members recommended alternative tools to facilitate discussion, chat and project management. These were barely considered by the project manager or other key players; perhaps because the software was unknown to them, or perhaps, like myself, they had little time to teach themselves new tools and acquire the benefits. WebCT was known to have the advantage that its user interface could be displayed in either French or English – a colleague demonstrated this feature at the first face-to-face meeting and so all partners appreciated this useful feature.

2. Lack of 'pull' from the 'VRE'

I did not feel that WebCT ever achieved a role as the primary repository or communications medium for the project. This was partly due to its late adoption and partly because the project manager failed to insist on its sole use.

The delays in setting up the project webs were frustrating – the project had been running for six months before WebCT was first demonstrated to the group at the face-to-face partner meeting in March 2004. A further twelve weeks passed before I received a logon code. I did not understand at the time that this delay was due to the need to negotiate licence fees with the project's home HEI.

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When I finally accessed the project web in May 2004, I found little content or activity. The project manager, facilitator and administrator all accessed the websites fairly regularly but only occasionally added content and postings. The administrator continued to circulate minutes and other key documentation by email throughout the project while the web Resources areas stood largely empty.

The lack of postings in some webs was notable, for example: only three postings in the administration and finance website to which twenty-one team members had access. The project manager frequently used alternative forms of communication with team members which were not visible to others (WebCT mail or chat, email, telephone or fax, private meetings). Similarly, team members used these mechanisms to contact each other without the project manager necessarily being aware.

A number of postings were made requesting more contributions from team members. It is not apparent, however, that participant access to the project websites was actively monitored. In fact, the creation of additional websites (rather than private groups within the main website) meant that the project manager was less able to monitor such activity without recourse to the WebCT Administrator function.

The project manager was the most active participant by far on the web which I managed (30% of all hits), made the most postings on all the management webs (typically 60%) and sent the most mails via WebCT. I found that each chat, mail or posting I made either generated no responses at all or received responses (often weeks later) which indicated a lack of understanding. As a result I accessed the project webs increasingly rarely and used email instead which drew prompt responses. Eventually, a colleague and I adopted the habit of emailing each other if we found that any of the project webs contained something worth logging on to see.

5. Case Study 2: A UK Managed e-Learning Project

This European funded project brought together senior and junior researchers and e-learning practitioners in universities from across Northern Europe. There were fourteen institutional partners, and over fifty individual members with varying involvement in the project. The project was organised into a project management group, seven special interest groups (SIGs), a development team and an evaluation team. It ran from November 2002 to May 2004 and has successfully completed its objectives, reported and disseminated the findings. Further collaboration between many of the partners continues. The project sought to build greater understanding of e-learning practice and theories and to connect a network of researchers and practitioners. One co-author of this article (*name deleted*) was a project member throughout the 19 months of the project and participated actively in each of the three research environments. The situational analysis and review here is based upon personal reflection, project documentation and scrutiny of the web spaces used to support the project.

6.1 SITUATIONAL ANALYSIS

Table 2 Ordered Situational Map of the UK Managed e-Learning Project (after Clarke 2005, p90)

Individual Human Elements/Actors	*Nonhuman Elements Actors/Actants*
- Project Manager - Researchers - Software developers - E-learning practitioners - Evaluators - Funding body adviser	- Lotus Notes (2 months - Private forums, Uploaded files) - socio-constructivist portal as VRE (14 months - public and private forums, uploaded files, web pages, wiki, who's online,

	- shoutbox, chat, repository)
	- Moodle as VRE (2 months, and ongoing - public and private forums, uploaded files, web pages, who's online, chat, repository)
	- Disparate Email systems
	- Project Work Plan and expected outcomes
	- SIG work plans and outcomes
Collective Human Elements/Actors	*Implicated/Silent Actors/Actants*
- Special interest groups (SIGs) - VRE development team - Evaluation team - Host University Management - Partner University Accounting - Funding body	- Partner University Host Research Groups - Future Funding Body Applicants - Researchers in the field - E-learning practitioners
	Key Events in Situation
	- Initial formation of online research collaboration – in Lotus Notes - Disruption in moving to the portal - Internal evaluation of the portal
Discursive Constructions of Individual and/or Collective Human Actors	*Discursive Constructions of Nonhuman Actants*
- Desire to use socio-constructivist environment - impending face-to-face meetings as impetus for online collaborations	- quirks and shortcuts of the interface not intuitive - disparity between public and private spaces - too many "rooms" and separation of uploaded documents from discussion forum
Political/Economic Elements	*Sociocultural/Symbolic Elements*
- Decision to use a particular platform chosen before project inception - Lack of a Ubiquitous e-Research Platform	- Underlying philosophical model to the VRE was very strong - slow response to feedback from participants - evaluation team attention elsewhere
Temporal Elements	*Spatial Elements*
- Delay in availability of the research platform - Lack of attendance by VRE developers at key meetings	- Geographic dispersion of project partners
Major Issues/Debates (Usually Contested)	*Related Discourses (Historical, Narrative and/or Visual)*
- Internal/external facing VRE - Usability of the VRE	- Virtual learning environment expertise underutilised within the VRE

What's in it for me?

	• Socio-constructivism
Other Key Elements	*Formal actions taken to resolve difficulties (additional category)*
• Budgetary constraints in re-modelling the VRE	• Resolution through move to another VR/LE platform • Increasingly external-face to the VRE

6.2 KEY ISSUES EXPLORED THROUGH PERSONAL INQUIRY

1. The promise of technology

The e-learning platform first used by the project was a relatively simple discussion board. Access was provided directly after the first face-to-face project meeting. For me, this had the advantage of being easy to use and was an opportunity to begin to share some ideas and discuss what we were intending to achieve within the sub-group I was active in. Contributions were lively, although there was a sense of anticipation, of a "better" research environment which would be launched imminently. The site was being built by a leading research team in Europe.

When the site was opened to the project members, however, there was an initial sense of dismay – followed by a slow and tentative start to the postings. The screen looked chaotic, text-heavy and with little discrimination between public and private areas. I found that my attention on screen was divided amongst many information windows, some of which were irrelevant but took up a large part of the screen, others of which were vital, but shown in compressed form. There were some elements that I welcomed, for example the "shout" box where any of us could post a quick hello to another project member we found online at the same time as us. Other elements, I found difficult to embrace, such as the repository for file storage, which was not sorted intuitively, could not be edited directly and was not linked to any discussion tool. On further investigation, I found that there were some highly attractive features, such as the ability to "subscribe" to a discussion topic and thereby receive messages in my email inbox with the option to reply straight back into the discussion topic. This is clearly not a new development in technology, so I was left wondering where the technology innovations lay in the VRE system. The site featured a wiki, chat, who's online, file repository, public web pages, each with some necessary user instructions. Whilst as a member of a research project, I and others in the team were willing to learn how to use the system, it rapidly became clear from the lack of responses to postings that many others had "been put off once" (email correspondence) and were reluctant to engage again.

2. E-learning researchers and e-researchers

Comparison VREs developed by the research team were based around a large and very active community of e-researchers. The researchers in the project in this case, however, were largely teachers who were interested in pursuing research into their e-learning practices and had a considerable degree of experience of using virtual learning environments and other technologies for learning. Our interests were more about the learning processes than the technical issues. My own expectations of a VRE were that it should be intuitive in the first instance, enabling text and images or video clips to be incorporated relatively simply into communication. There were additional steps required of the users, which I reported in a chat about the system design: "you can't easily jump out of typing a forum message to check the URL of the repository item. It is laborious." (extract from chat log). Reconciling these expectations with the functionality of the VRE was difficult. The separation between public, private (project-wide) and private (sub-

group) spaces is a distinction that many VLEs have tackled with varying success. I therefore welcomed the final decision by the project, prompted by an internal evaluation of the VRE, to move the project to a VLE with VRE capabilities and pursue the research from there. Within this new VR/LE I was in the end able to conduct productive and collaborative, synchronous and asynchronous work within the research team.

6. Reflections

Our experience and analysis of these case studies suggest that virtual collaboration remains problematic for small-scale pedagogical research project teams for many reasons. Often working outside the main CSCW community and unaware of much CSCW development and literature; we resort to what is familiar, what is affordable, what is promoted most volubly by our technical partners and what is most easily available. The result might be a random collection of application software and/or the re-use of our favoured VLE. Where the solution is found by team members to be inappropriate or difficult, it may be rejected by them and a simpler modus operandi developed.

We note similar patterns in other geographically distributed projects. For example, a global IT project team replaced Documentum with a custom-built web file management system on the grounds of cost, an international management administration group replaced Lotus Notes with their own team repository in order to gain easier web-based access to files. Our own colleagues prefer to use email with attachments to the web-based repository we have provided because of lack of time to be trained in its use. It is important, therefore that we work to minimise the technical hurdles to novice members of our CoP. "We have also learned, however, that boundaries that are empowering to insiders are often barriers for outsiders and newcomers to a group" (Fischer 2004, p 156).

The cry "what's in it for me?" echoes Grudin's (1988) concern about "who benefits?" – that is, the conflict between who in a group gains knowledge and/or convenience from a system function and who has to put in the effort to enable the function to work properly. In the hierarchical world of our VLEs, both staff and students benefit from resources that staff make available, but this is not the case in the more collegial world of research projects. Without firm project management, visible communication and the loading of resources into any digital repository cannot be expected to be adopted by all team members since they will tend to communicate and share resources in the easiest way. We observed similar behaviour in the support and implementation of VLEs where issues that were crucial to one participant were discounted by other participants and/or by technical support. We called this "if you don't feel the pain, you can ignore it" (*Reference removed*). Similarly, Grudin recognised that CSCW applications will benefit their users "by integrating with the systems people use for other aspects of their work" (Grudin 1988, p90). Separating the VRE from the VLE allows IT support to ignore more easily any difficulties encountered in either environment.

The necessity to involve geographically dispersed partners in funded projects and the pressures to conduct this work in alongside other commitments means that e-Research is inherently difficult to manage. However, Fischer (2004) reminds us of the opportunities that complement the barriers created by spatial and temporal barriers – lone and small-group researchers can benefit greatly from global collaboration.

Increasingly, research team members are expected to be able to use ICT almost intuitively, yet researchers may not have the necessary skills. Despite the mandatory VLE requirements at our institution, we still encounter colleagues (usually those with large research or managerial responsibilities) who have avoided using it and who do not wish to 'waste time' being trained.

What's in it for me?

A difficulty with major national and international VRE development is that they become so vast that they cannot respond flexibly to changes in technology and society. Crabtree et al (2005) highlight the social and 'playful' use of CSCW in 'ludic pursuits' and their potential to inform CSCW design.

> "As research moves out from the workplace to consider how IT may be situated in a broader range of social settings, then CSCW must also move with it to consider how best to inform technological development within these contexts, unless it is to run the risk of becoming a historical curiosity rather than a vibrant living research community" (Crabtree et al 2005, p247).

National and international e-Research initiatives appear to be more concerned with product than process, such as the sharing of artefacts rather than co-construction. Fraser's assertion that "a VRE must be embedded and owned by the communities served and cannot realistically be developed for the research communities by others in isolation" (Fraser 2005, p3) is pertinent here. Since the central requirement small-scale research project teams – that VRE facilities be immediately and ubiquitously available – has not been satisfied, we question whether our requirements for the simple, compatible systems are being captured appropriately.

7. Small-Scale E-Research System Requirements

We consider that the requirements collected from the iPED research group since its inception in April 2005 are likely to be typical of other similar groups, although this requires further investigation. These provisional requirements have been drawn from the user needs expressed in group meetings, in daily exchanges and observed activity, as well as from our investigations into previous virtual collaborations and current VRE initiatives. They also reflect colleagues' positive and negative experiences of other Internet provision such as e-Commerce sites, VLEs, popular network capacity-building sites such as bbc.co.uk and Internet art resources (*reference removed*).

1. The need to recognise the rivalry between researchers (both individuals and groups) and to provide suitable protection for intellectual property.

2. The need to facilitate collaboration between researchers and their external partners.

3. The need to facilitate mentorship and development of novice researchers and to support the integration of new members into the CoP.

4. The need to support easy access via a range of static and mobile devices allowing access wherever, whenever.

5. The need to make the environment playful and pleasant to use, rewarding participants and recognising those who contribute most effectively.

6. The need to integrate the VRE seamlessly into daily working life including with the chosen VLE.

7. The need to facilitate discussion, brainstorming and creative activity, and the drafting and revision of documents by individual and groups.

8. The need to enable individuals and groups of researchers to identify this VRE as a 'market leader' and to engage with it without the need for large investment nor the major involvement of their ICT providers.

Note: There is no implied priority in this sequence.

What's in it for me?

8. Conclusions

Both nationally and internationally educational research, like educational development, is "diverse and fractured" (Land 2004 p 194). Our main concern is to establish a virtual environment which will enable the pedagogic community to cohere, to broker international collaborative projects and to provide support for lone educational researchers wherever they may be located.

The need for global cyberinfrastructure to support large-scale e-Research is beyond the scope of this study. The need for a ubiquitously available infrastructure to support small-scale e-Research is urgent and overdue. The lack of a widely recognised solution to virtual collaborative research needs has resulted, and continues to result, in the use of unsatisfactory ICT provisions which create barriers to effective cooperative work. End-users respond by rejecting these systems and/or by adopting of ad hoc compensatory practices.

While major national and international groups pursue their visions of cybersolutions, ICT continues to evolve. In the absence of even a partial, but widely adopted, VRE, small-groups like our own are likely to develop their own interim solutions.

In conclusion, we recommend firstly: the wide-scale dissemination of any existing VRE provision as a means by which national and international initiatives could address current requirements. Secondly, the creation by organisations such as JISC of a portal providing access to any recommended VRE, giving those selecting it the 'authority' to back its use.

Finally, the involvement of 'outsiders' into the evaluation of prototypes would help VRE developers to meet the needs of those unfamiliar with the established VRE agenda.

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