

Personalisation of learning: constructing an interdisciplinary research space

Research Report

1. Background

Introduction

The 2006 UK Technology Enhanced Learning (TEL) Programme invited a reconfiguration of TEL research in terms of the *new collaborations* (interdisciplinary), *new accountabilities* (users and others) and the building of capacity for “developing relationships and networks, sharing perspectives and building alliances with present and future stakeholders both within and beyond the research community” (Pollard, 2005:4).

In response to this invitation our six-month development project had two parallel aims:

- (A1) To investigate the discourse processes, practices, and challenges of interdisciplinary research (IDR) by exploring the key TEL theme of personalisation of learning.
- (A2) To develop a competitive interdisciplinary TEL research proposal, including the mobilisation of external partners and users groups.

Collaborations between academic disciplines, sectors, practitioners and users are a key characteristic of contemporary knowledge production and its emphasis on ‘practice’, ‘working knowledge’ and ‘relevance’ (Symes & McIntyre 2000; Gibbon et al, 1994). Research on interdisciplinarity in the Sciences, Engineering and Medicine has shown that IDR is already an integral feature of modern research as a result of four drivers:

1. The inherent complexity of nature and society;
 2. Research problems and questions that span across more than one discipline;
 3. The urgency of societal problems;
 4. The power and affordances of new technology
- (Facilitating Interdisciplinary Research, 2004:29).

These drivers are relevant to TEL, but as TEL research spans across social and technological sciences, an additional concern of TEL research is the need to engage with users, practitioners, and stakeholders. In our TEL research (predictably) the dialogue between disciplines and stakeholders occurs within a contested space. This requires a considerable amount of negotiation (see Scheeres & Solomon 2000a; Scheeres & Solomon 2000b; Solomon et al 2001) as the participants work around various stakes, investments and power relationships. As a consequence of these negotiations, the interdisciplinary outcomes are part of the process of building capacity.

Project Group

The project group was made up of 8 collaborators from different disciplines and fields (social sciences, education, human computer interaction design, computer science, informatics, and business). Included in the group were 3 professors, 3 programme directors, and 2 learning technologists. The group considered itself ‘viable’ for four reasons as follows:

1. A common shared interest in TEL and the personalisation of learning;
2. Individuals in the group understood themselves as ‘users’ who personalise digital artefacts as ‘learners’ and ‘researchers’;
3. The researchers had professional relationships with potential user groups, and external partners;

4. Group members were all located at City University which enabled the development of practitioner research networks within a responsive infrastructure for the learners in the professions.

Prior to the project, the researchers in the group had institutional connections (as part an Open and Distance Learning Special Interest Group), yet they had had no previous experience in working together as a research team. Each team member was located within a school or department of City University, and as such was located within specific organisational structures, subject areas and discourses. The need to work with these differences exemplified the many challenges faced by an interdisciplinary team.

Previous research

In the past two decades European research into interdisciplinarity has been driven by national and international interest in innovation and competitive advantage (EURAB Report, 2004), while in the USA attention has been focused on Medicine, Science and Engineering (e.g. Facilitating Interdisciplinary Research, 2004). Findings from these and other research (Bruce et al, 2004), are concerned with supporting interdisciplinarity in terms of developing policies, procedures, and funding streams, and with understanding organisational models that encourage or discourage interdisciplinary research. We found that some reported findings supported our experience of interdisciplinary research especially:

- The structural constraints of cross disciplinary collaboration in HE intuitions that are organised by disciplines;
 - Under researched reference criteria for evaluating the quality of interdisciplinarity work.
- (Executive Summary Facilitating Interdisciplinary Research, 2004).

On the other hand we suggest that some previous work characterises IDR in terms of consensus, integration and synthesis and this we challenge in our findings. In some cases there is a naïve view of Social Science as exemplified by one of the findings from Committee on Facilitating Interdisciplinary Research, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine:

“8. Social-science research has not yet fully elucidated the complex social and intellectual processes that make for successful IDR. A deeper understanding of these processes will further enhance the prospects for creation and management of successful IDR programs.”

(Executive Summary Facilitating Interdisciplinary Research, 2004:3)

Our theoretical position is that the focus on consensus and integration through IDR does not draw on understandings emerging in the literature. This includes research in Science and Technology Studies (Latour, 2006, Law, 2005), the work on reconstruction of learning (Chappell et al, 2003) and on knowledge in flux (DuGay, 2000), or contemporary concerns with networks, time and space and materiality in education and the social sciences (Castells, 2005, Edwards and Usher, 2007; Searle, 2003).

Previous work in personalisation of learning and the role of technology is broadly compartmentalised in 5 areas: (i) work around new technology invention and innovation (EU Information Mobility, 2001); (ii) examples of new practice developed through action research (Personalised Learning A commentary by the teaching and learning research programme, 2005; A National Conversation about Personalised Learning, 2004), (iii) Adaptive education and learning styles (e.g. Coffield et al 2004); (iv) Policy discourse (e.g. Johnson, 2004); and (v) E-learning applications (e.g. Interactive LogBook Final Report, 2006). This diversity was represented in our group and in addition there were important differences in understandings of learning, pedagogy, and technology, both between disciplines but also across disciplines.

In our investigation of personalization of learning we stepped outside the prevailing definitions and classifications and reasoned that in general terms there are likely to be patterns of similarity and differences in how digital artefacts are selected, configured, tailored, adapted and used by users who are also learners as they move between environments and context in their working lives. We went back to first principle and empirical data in the spirit of *let us look at what is going on here*.

2. Objectives

In this section we describe project achievements in relation to planned objectives.

1. *To develop an interdisciplinary partnership of academic researchers whose collective research interests will enable the development of an innovative large scale TEL research project.*

Objective completely met.

Internal City University partnerships have been forged. Twelve researchers have participated in the Delphi conversations from a range of disciplines and fields (social sciences, education, human-computer interaction design, computer science, informatics, and business). The collaborators have convened 5 user groups in professional development settings (online tutoring, voluntary sector, maritime sector, health care and geographical information systems). The bringing together of these academics, user groups and settings were enabled by the project.

External relationships have been established with research projects, universities, researchers and user groups in the collaborative development of a project proposal for further TEL research. Relevant relationships include:

- Dr Patrick Carmichael CARET at Cambridge University, Transforming perspectives: technology to support the teaching and learning of threshold concepts (TLRP/TEL funding).
- Prof. Richard Edwards, IoE Stirling University, TLRP Thematic Seminar Series – Contexts, Communities and Networks: Mobilising Learners Resources and Identities across Domains.
- Prof Rob Walker, Centre for Applied Education Research at East Anglia University. UNITE European IST project (Framework P6) and 'Visual Dialogues' project initiated (Tate Interpretation and Education Departments in partnership with a range of museums around England)
- Louise Corti University of Essex - Economic and Social Data Archive (UKDA)
- Prof. John Carlton, Marine Services, Lloyds Register, UK

An international partnership is currently being negotiated with University of Technology Sydney Australia.

2. *To build relationships within the research team across the discipline areas, that involve the mobilisation of external partners and users groups, in order to investigate the benefits of interdisciplinary and user collaborations focusing on personalisation of learning and the use of digital artefacts. This will involve a research process for articulating, exchanging and negotiating various perspectives using information and communication technologies in order to create new knowledge and practices.*

Objective completely met

Collaborators worked with colleagues and users on four main tasks. (i) writing an account of their own personalisation of digital artefacts; (ii) participating in a workshop to develop key questions around interdisciplinarity and personalised learning; (iii) participating in the DELPHI process to facilitate structured responses/conversations around the key questions (7 meetings and 2 online conferences); (iv) facilitating user groups to extend the conversations on personalisation of learning.

The text and audio data from the workshops and online seminars have been compiled into data sets using NVivo qualitative data analysis software. This includes a meta account of qualitative data and technical information from the project for access by the wider researcher community (in line with the Ethical Guidelines published by BERA). An online environment within City University has been used to manage the project, to host the online conferences and to archive the qualitative data.

Findings from this work have been disseminated in various seminars and conferences (see section 1.4). There has been a request from JISC, staff at City University and elsewhere for access to our planning notes on facilitating interdisciplinary working. A website is planned for this purpose and also to share the grey literature on the project themes.

3. *To analyse the discourse processes involved in interdisciplinary research in order to understand the way people, language and social systems can work together and build collective capacity. This will involve identifying processes for working across various epistemological understandings including the perceptions of researchers and users of 'good practice' in interdisciplinary collaborations.*

Objective met (but not as framed).

We have analysed the discourse processes and some conclusions and claims have been reported. Our findings around working across epistemological understandings suggest that interdisciplinary research is a gradual process that involves working with differences, building relationships, using sophisticated interpersonal skills that work with the various power relationships across the discipline areas and the hierarchical structure of the team, and to a certain degree learning the language of different disciplines. Furthermore there is an important leadership role in facilitating the complex negotiations and developments of new forms of knowledge and mediation. These findings differ from the more prescriptive rhetoric in the discourse of 'good practice'. While we do not claim to have 'solved' the 'problem' of how to practise interdisciplinary collaboration, we do have preliminary evidence that challenges some of the assumptions around integration, synthesis and consensus.

4. *To begin to conceptualise a hybrid theoretical framework for the personalisation of learning and the use of digital artefacts that can provide a model for interdisciplinary work for research and pedagogical purposes.*

Objective met (but not as framed).

The short time frame of the project, together with the theoretical decision not to battle with the differences or aim for consensus, meant that the conceptualising of a hybrid theoretical framework for the personalisation of learning is only in the early stages. Our provisional conclusion is that it may not be possible to develop interdisciplinary consensus on the construction of 'personalisation of learning'. Some of the collaborators interpreted this to mean that in spite of our best efforts to date, we simply did not reach a consensus. However for others in the project, the framing of the objective was in itself problematic as it suggested that we either did or did not succeed in finding a *singular or 'grand'* hybrid theoretical framework for personalisation of learning.

In practical terms this meant that the collaborators worked together (see methods) in the first half of the project. Following this the user studies demonstrated diversity in the take up of practices across disciplines and, yet again, diversity in how personalisation of learning is understood.

Our approach meant that instead of battling with differences we chose to make space for different pathways and to construct spaces for conversation which resided outside all our disciplinary practices. This suggests the beginnings of a conceptual model of personalisation of learning. Importantly any framework will need to take account disciplinary differences as well as the increasing merging of fields of practice and subject areas and the movement of learners/teachers/researchers across social and work domains. In practice this means recognising curriculum and learning activities that are stable and therefore recognisable within particular communities of learners and teachers, but at the same time allow for variations in research and pedagogical practices.

3. Methods

The project team comprised researchers from: social sciences, education, computer science, informatics, and business; all with experience and interest in the topic of personalisation of learning. There was also a shared interest in the new research grant opportunities for working with interdisciplinary partners when researching the uptake of new technologies for improving learning processes and learning outcomes.

The construction of an IDR space was taken up in five ways:

1. *By using an adapted version of the DELPHI process to organise our conversations.* This began by generating key questions for example “What do you understand by interdisciplinary” and “What do you understand by the term personalisation of learning.” In addition the collaborators also suggested key readings and explanation text which articulated their disciplinary position. These questions were discussed in different modes led by different members of the team e.g. a face-to-face workshop, online conference and a meeting format with personal response software and electronic voting handsets. The objective was to sustain interdisciplinary conversations while collecting qualitative data on both the content and process of the interdisciplinary working.

Summary of DELPHI Process Phases

1. Participants write a position statement about their past experience and understanding of inter, multi, cross disciplinaryity.
2. Questionnaire is published.
3. Participants respond and send to CitySpace (following the tested process to compile anonymous dataset).
4. Responses are synthesised concatenated and published.
5. Participants review output from 4 and add reflective comments.
6. Discussion phase in different modes (dates will be published).
7. Participants review output from 4 and add further reflective comments and/or changes.
8. Participants comment on the representation of the output.
9. Statements are discussed face to face and voting takes place (if this is viable).
10. Participants write an end of process statement reflecting on the process of interdisciplinary working, and original position statement, and also commenting on changes compared to position in step 1.

2. *By investigating our in situ differences.* Each of us completed a writing task that recognised ourselves as ‘professional workers’, ‘learners’ and also ‘users’ who personalise digital artefacts. Importantly the writing was in a genre that was not typically located within any of our disciplinary worlds. The title was ‘Me and my artefacts’ in the style of ‘A day in the life of...’ We agreed to use ‘I’ in the writing. These accounts were anonymous and treated as qualitative data as they articulated everyday personalised usages of digital artefacts as people operate between domains of practices in their everyday lives.

3. *By enabling the flow of learning between spaces.* Activities in 1 and 2 exposed the group to new information, techniques, perspectives, methods and concepts and some were taken up, *but also changed*, in the design of further studies by members of the team. Some examples are: (i) private practices of desktop personalisation by informatics researchers; (ii) the personalisation of informal learning software amongst voluntary sector organisations; and (iii) understandings of interdisciplinarity among Human Computer Interaction (HCI) PhD students.

4. *By deconstructing various understandings of ‘interdisciplinary’ and ‘personalisation’ at University wide events:* (i) City University Staff Development Week called ‘Learning Futures – Now It’s Personal’; and (ii) City University Seminar Series: Multidisciplinary Research in Key Settings.

5. *By analysing the lessons learnt from developing a new interdisciplinary TEL research project including:* (i) making connections with other research projects; (ii) building relationships to develop a national interdisciplinary team; (iii) linking with international partners; and (iv) resolving issues around intellectual leadership, power, status and project control.

In these spaces our work on personalisation and interdisciplinarity has taken a number of directions. Increasing participation and engagement through activities and conversations has been part of the process of building capacity.

4. Results (Insights and Provisional Claims)

The results are divided into findings and claims. Findings are preliminary and offered as new insights rather than definitive 'results', and the three provisional claims are assertions based on the findings. The focus on IDR rather than personalisation is deliberate and an explanation is offered as part of claim 3.

Definition:

IDR generates new knowledge that comes from new learning. It takes place in multiple reciprocal communications such as conversations, writing and joint activities which include researchers from different disciplines, TEL practitioners, and users, who are committed to working together towards new ways of understanding, investigating, and developing TEL.

Findings

1. IDR needs experienced researchers across the TEL discipline areas. Experienced researchers are status/career conscious implicating complications in power relationships around roles and responsibilities, project leadership, allocation of funding as well as recognition and esteem. On our project cross discipline/sector commitment was enabled by naming all academic participants as co-investigators.
2. Most HE institutions are organised along disciplinary lines and the policing of boundaries means that academics regard IDR as an aside other activities.
3. The success of IDR groups depends on institutional commitment and management leadership as well as intellectual leadership.
4. New researchers and PhD students are more concerned with disciplinary allegiance than experienced researchers.
5. IDR depends on researchers being about to articulate the relevance of their work and relevance of research from their discipline in tackling complex problem.
6. IDR requires a commitment to reflexivity and self awareness, for example in the customs and practice of behaviour in seminars. This takes time and depends on quality of the relationships.
7. An important facilitation/communication role is taken by researchers who have been apprenticed in more than one TEL discipline.
8. IDR in TEL requires working with the languages and cultures of researchers' from different traditions.
9. IDR needs to accommodate pluralistic methods. IDR challenges received constructions of differences between qualitative and quantitative research paradigms, and understandings of concepts like validity, verifiability, generalisation, proof of concept, design requirements and hypothesis.
10. IDR is fluid in focus in response to engaging with multiple users, user groups, stakeholders, and researchers.
11. IDR requires time to manage the logistics of working with ontological and epistemological differences. There is an 'incredulity' phase in the exposure to new norms and values, as well as methods, languages and culture.
12. IDR activities seem to thrive in agile teams which evaluate and analyse constantly and if necessary redefine the research and the review criteria in response to new understanding.

Our first claim is that IDR is about understanding and enabling a strong and sustained commitment to work together.

We found evidence that disciplines are disciplining and that researcher identities are located within particular discourses, histories and social structures which give rise to particular kinds of research questions and research practices. IDR threatens academic identities located dogmatically or exclusively in the social, cognitive or computer sciences, and indeed newer disciplines, and practices; therefore - quality of the relationships, social dynamics and interpersonal skills are integral to success.

We found that interdisciplinary activity did not sit comfortably with all the collaborators but TEL ideas and research methods did cross over disciplines and were taken up unexpectedly. We have consolidated a new interdisciplinary consortium and developed what our evaluation (and peer review) suggests is a genuinely interdisciplinary and new TEL project bid for funding.

Our second claim is that TEL interdisciplinarity is about working with disciplinary differences rather than battling through them.

Previous work in the Sciences, Engineering and Medicine has characterised IDR in terms of consensus, integration and synthesis. We found that the enactment of differences, between and within TEL disciplines, shows that ontological and epistemological differences cannot be collapsed or merged. The differences are not trivial or irrelevant. In TEL research, claims about integration or synthesis may hide the powerful dominance of established research paradigms and the rhetorical announcements of ‘interdisciplinarity’.

Our third claim is that TEL interdisciplinarity is about managing the complexity of fluid results

The ebb and flow (fluidity) in the shifting context on our project shows that different complexities and simplifications coexist. What needs to be simplified for one purpose or audience may need more complex treatment for a different purpose. Our fledgling conceptual model of personalisation of learning frames and supports curriculum and learning activities that is recognisable within particular communities of learners and teachers (and so stable). At the same time the fluid interpretation of results allows variations in practices that take account of the blurring of boundaries between fields of practice and subject areas, and the movement of learners/teachers/researchers across social and work domains. Research methods helps create what we draw attention to and what is relegated to the background or suppressed.

IDR entails making choices about the significance and relevance of differences and strategies to work with uncomfortable partial consensus. This means IDR is pluralistic, advocating a more painstaking treatment of taken for granted research methodologies, research practices, abstractions, and representations. It can be argued that a barrier to IDR is that academics value new representations and abstractions above description. Working with multiplicity advocates a slower and more modest journey in which the researcher accepts other stakeholders as equal partners; and also accepts a variety of different accounts of the world (as empirical data) including rich verbal descriptions, written accounts, observations, as well as numerical data, usage logs, design cases, user requirements and more.

5. Activities

20-21 September 2006: TEL Conference, Wolverhampton

Project team gave a presentation of the project aims and activities.

20-22 November 2006: TLRP Annual Conference, Glasgow

Project team presented a short paper on “Interdisciplinarity: meanings and practices in the personalisation of learning”

22nd February 2007: ‘Transforming Perspectives’ Seminar, Cambridge

Presented a paper ‘Using the Learner as an Actor in E-space’

23rd April 2007: Multidisciplinary Research in Key Settings, City University Seminar Series.

(<http://www.city.ac.uk/research/events/keysettings.html>)

Members of the project team presented a paper ‘We are all learners now: Problematising the learning context’

November – April 2006-07: 5 user workshops on personalisation in informal learning in not for profit sectors: 0: Pilot at City University Business School staff and partners 1: RNIB London 2: West London College, Isleworth 3: South Wye Learning Centre, Hereford 4:Gujurat Hindu Centre, Preston

21-25 May 2007: City University hosted Learning Futures Week – ‘Now It’s Personal.’

Learning Services, project collaborators and invited speakers on the theme of personalisation and the future of education. http://www.city.ac.uk/news/archive/2007/06_june/11062007_3.html

22-24 June 2007: International Conference on Researching Transitions in Lifelong Learning.

Presented a paper: 'Moving where? Problematising Knowledge Cumulation in Technology Enhanced Learning'.

Post project

29th November – 1st December 2007: Discourse and Cultural Practice Conference, University of Technology Sydney. Conference paper, 'Interdisciplinary Research: A fiction?'

2nd – 5th December 2007: Fifth International Conference on Researching Work and Learning. The Universities of the Western Cape and Cape Town, Cape Town South Africa. Conference paper: 'Reassembling learning contexts and learners'.

City University hosted Learning Futures Week – 'Now It's Personal.'



“The Keynote lecture about the personalisation of learning was delivered by Chris Yapp, former Head of Public Sector Innovation at Microsoft. Chris presented a challenging vision of how institutions could prepare for change and enhance learning through technologies.

To round off Learning Futures Week, E-Learning Services hosted a discussion panel which debated how learning might look come 2020, incorporating the increased personalisation of learning and use of Web 2.0 technologies. Both staff and students attended, and all sides participated in the lively debate that followed.

The panellists included Patrick Carmichael, CARET (Centre for Applied Research in Educational Technologies, University of Cambridge); Anne Greenhalgh, The Wharton School, University of Pennsylvania; Mark Johnson, CETIS (Centre for Educational Technology and Interoperability Standards); Kevin Swindin, Director of Services and Chief Information Officer, City University.”

http://www.city.ac.uk/news/archive/2007/06_june/11062007_3.html

6. Outputs

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Further publication is envisaged as follows:

1. Reassembling Time and Space in Higher Education for the Professions: *Journal of Studies in the Education of Adults*
2. Tracing Uncertainties in Interdisciplinarity Research: *Association of Learning Technology Journal*.

3. The Personalisation of Learning: a Persuasive Practice *Discourse – Studies in the Cultural Politics of Education*

Conference paper, 'Interdisciplinary Research: A fiction?' to be presented at the *Discourse and Cultural Practice Conference 29th November – 1st December, 2007, University of Technology Sydney*

7. Impacts

Individual researcher-learners:

Some collaborators on the project experienced collaborating with researchers and practitioners outside their home discipline for the first time. The group would not have come together without the specific remit of the project. While many of the individuals saw themselves as drawing on multiple disciplines in their work (as in e-learning and HCI) the complexities of doing interdisciplinary research challenged all.

Disciplinary communities:

Critical commentary from HCI, informatics and Business Studies has steered researcher from education and the social sciences to explore Actor Network theory and Science and Technology Studies to understand the activity of human and non human actants in Teaching and Learning. Other collaborators have also positioned themselves in relation to interdisciplinary research and personalisation of learning.

The academic community at City University:

The themes of personalisation and interdisciplinarity have been taken up at City University as part of the discussion on institutional restructuring models and 10 year planning. E-learning practitioners-researchers at City University have used the project connections and capacity building resources to lead a University-wide debate on personalisation of learning in different disciplines.

The academic community generally and the research councils

Publications from the project have attracted the attention of academics working in the area and some of these relationships have been mobilised into partnerships and future collaborations.

User communities

Events at City University and workshops with voluntary sector organisations, HE students, community groups, and policy audiences have raised the profile of collaborative research, user engagement and discussions around desirable outcomes.

8. Future Research Priorities

Drawing on previous work and the findings reported here future research priorities include investigation into:

1. Structural constraints of cross disciplinary collaboration in HE institutions that are organised by faculty, schools and departments and how cross institution research can be nurtured and sustained.
2. Evaluating the quality of TEL interdisciplinarity work which goes beyond contributing to individual disciplines or subfields e.g. computer science, cognitive science, and HCI.
3. Theoretical frames and methodologies which can work with disciplinary differences.
4. Tracking the take up of practices and ideas from different disciplines in interdisciplinary projects.
5. Personalisation of learning as rhetoric and educational discourse. For example the ways in which personalisation (and other concepts) are taken to have an independent pre-existence in a social reality to be explored rather than emergent from discursive and material practices.
6. Characteristics of conversations spaces in which interdisciplinary practices are constructed and sustained.
7. Sustaining user engagement and partnerships in larger scale TEL research.

8. Sustaining and managing ‘conversation spaces’ as the participants work around various stakes, investments and power relationships in larger scale TEL research.
9. Communication barriers in terms of explaining complex disciplinary research to different ‘user’ audiences e.g. researchers from different disciplines, students, the professions and policy makers.
10. What are the ethical and value questions in TEL interdisciplinary research e.g. what is ‘good’, ‘worthwhile’, or ‘important’ learning or technology.

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