



RESEARCH ON TECHNOLOGY ENHANCED LEARNING¹

Understanding, creating, and exploiting digital technologies for learning

CALL FOR RESEARCH PROPOSALS

Summary

1. ESRC, in a funding partnership with EPSRC and the e-Science Core Programme, wishes to commission a set of inter-disciplinary research projects addressing a number of key research challenges on technology enhanced learning. The investment will be managed as a part of ESRC's Teaching and Learning Research Programme (TLRP).
2. To be eligible for this competition, applications *must* be interdisciplinary and drawn from *across* the fields of research traditionally supported by ESRC and EPSRC.
3. Applications are invited from research teams / consortia involving researchers providing a range of expertise cutting across the remits of the ESRC and the EPSRC along with partners in other education and/or training organisations and/or technology design organisations, as appropriate.
4. Applications may be submitted by researchers based at any UK higher education institutions or other independent research organisations eligible for research council funding. Consortia, may involve, but are not required to involve, more than one UK HEI (or eligible independent research organisation).
5. These projects will be selected in two rounds of bidding. The first is likely to support teams or consortia that already have some experience of working together, whilst the second will offer opportunities to form new interdisciplinary research and user partnerships for the purpose of bidding for development awards. Applications submitted under the second Call, which emerge from development awards, will be considered on their individual merits, and will not be given priority for funding.

¹ This Call uses the phrase 'technology enhanced learning' to refer to what has recently been termed 'e-learning'. The European Commission is currently using the phrase 'Technology Enhanced Learning' for Framework VII, and will promote it as a 'new' research area. This Call uses the same phrase in order to support that vision, and to ensure alignment with European research groups working in the same field.

6. Under this first Call the Research Councils have allocated up to £6m to support both a small number (3-5) of large innovative and interdisciplinary research projects of up to 4 years duration, and also to support the development of new interdisciplinary partnerships through funding for a number of smaller scoping studies, networking and developmental awards for up to six months. Holders of such development awards will be able to apply in open competition with other proposals under the second Call for large research projects which will be announced in 2007.
7. Proposals are therefore invited under the following two headings:
 - i) outline proposals for large research projects of up to £1.5m FEC (of which the Research Councils will meet 80%) for periods of up to 4 years to start from April 2007 onwards from teams / consortia with innovative research ideas addressing the themes below and that can demonstrate strong interdisciplinary and user partnerships.
 - ii) full proposals for awards of up to £60,000 FEC and up to 6 months duration seeking to explore innovative ideas and/or develop new interdisciplinary and user partnerships to address the themes outlined below, which could include scoping or pilot studies, networking or other capacity-building or development activities.
8. User engagement and partnership throughout all stages of the research and the support of fundamental research and innovation through to effective application and use in relevant learning contexts are key aspects of this Call. Applicants for large research projects will be expected to build such considerations into their research design and to include a communication and knowledge transfer strategy within their full proposals (if shortlisted).
9. Proposals must be submitted through the Joint Electronic Submission System (Je-S) by the closing date of 12 May 2006. The outcomes of the Panel's assessment of full and outline proposals will be announced in July 2006. Capacity / development activities will then be expected to start in late 2006 or early 2007. The deadline for shortlisted applicants for large projects to submit full proposals, following the initial selection round, will be in October 2006.

Context

10. E-learning, or technology enhanced learning (TEL) has been identified as being of key importance for the UK government and there are official strategies in relation to particular educational sectors in Northern Ireland, Scotland, Wales and England. This programme of research will build strong conceptual foundations in an area that is recognised as crucial to the future of learning in the UK but which also has global implications. A number of documents considered in the preparation for this Call are listed in the Annex 1. Other links are provided at www.tlrp.org/e-learning.

9. The relevance of research proposals and the potential for knowledge transfer in relation to such aspirations, policies and practices is important to this funding initiative. Whilst research applications will be expected to focus on the fundamental issues and underlying technologies which are expected to underpin such developments, the programme is also looking for such applications to include innovative approaches to the application, use and evaluation of the knowledge and technologies generated in relevant learning contexts.
10. Between 2003-2004, a *consultation on e-learning* was held across the academic community and a subsequent workshop was held with a group of academics from many different disciplines. This consultation process was funded jointly by EPSRC, ESRC and the core e-Science programme. The resulting report, 'An e-learning Research Agenda', has contributed significantly to the Call outlined in this document. The report identified four research areas for collaboration across the social/educational and technical/computing research communities. These were:
 - Modelling and dynamic evaluation
 - Informal and lifelong learning
 - Creativity and problem solving
 - Inclusion and accessibility.

Two cross-cutting multidisciplinary challenges were also identified:

- Technological challenges in e-learning
- Economic, social and cultural challenges for e-learning.

A summary of the report in relation to these themes is appended to this Call.

The full document is available at:

www.epsrc.ac.uk/CMSWeb/Downloads/Other/E-learningResearchAgenda.pdf

11. The consultation took place against a background of significant development of advanced ICT techniques. They are establishing an advanced e-infrastructure that includes the virtualisation of computational and data resources through the techniques of Grid computing, the automated processing, integration and reuse of information through Semantic Web technologies, support for knowledge sharing and distributed team-working, and new mobile and ubiquitous computing systems.
12. A computer science research agenda which is applicable to technology enhanced learning includes personalised tools, services and environments, context-aware computing, mobile computing, enhancement of collaboration and workflow tools and services, autonomic (self-managing) systems, human computer interaction and context-aware computing amongst others.
13. Every member state of Europe now has an e-science programme, and the EC IST programme supports concertation activities in areas such as Semantic Grid and

standards. The US cyber-infrastructure has also been influential. These meet internationally through community efforts such as the Global Grid Forum (GGF) and nationally through the network of e-Science centres and the e-Social Science community.

14. Such new developments stand to benefit the entire learning technology lifecycle, starting with the conceptualisation, design and development of systems and content to support learning experiences and opportunities, through to deployment, maintenance, evaluation and reuse. Importantly, they can support practitioners and stakeholders at each stage including teachers, learners, administrators, researchers and service providers.
15. This Call applies to any learning context both within the formal education system and beyond. However, recent educational research on classroom use of information and communication technologies (ICT) has found that teachers continue to be centrally important in designing and supporting learning with ICT across the curriculum. The potential of new technologies is still not being realised, with few teachers and lecturers making full use of computers and other technologies.
16. Collaboration across disciplines in the academic community indicates a willingness to understand the bigger picture in pursuit of innovative, creative and exciting solutions to supporting learning across contexts, cultures and age groups. The funding bodies are keen to support interdisciplinary collaboration which will produce high quality research and contribute to innovative, creative and exciting solutions to supporting learning across contexts, cultures and age groups.

The Teaching and Learning Research Programme

17. Given the need to bring together understandings of both learning and technology and draw on perspectives from the social, cognitive and technological sciences, it has been decided that ESRC will lead the investment, working closely with the EPSRC and other partners. In view of the close links between the aims identified through the consultation with the aims and objectives of the Teaching and Learning Research Programme (TLRP) it has further been decided to manage the initiative as a further phase of the TLRP and award holders will be expected to make a significant contribution to the Programme.
18. The *Teaching and Learning Research Programme* is a £38m initiative involving, at present, some 450 researchers. Previous phases of the Programme have been funded by the HEFCE, DfES, Scottish Executive, National Assembly for Wales, Northern Ireland Executive and the ESRC. Through its research, it aims to improve outcomes for learners of all ages in teaching and learning contexts across the UK. The Programme manages some 60 projects and also coordinates a number of thematic investments. It has strong links with many user organisations and has established a significant range of output vehicles for dissemination and impact. The Programme aims to be interdisciplinary and support the development of research expertise and capacity in teaching and learning. TLRP is managed by a Directors' Team of six part time academics. A

new senior appointment to lead and support this technology enhanced learning initiative is being made, and the successful candidate will work closely with the current TLRP Director.

19. Proposals should show awareness of TLRP's core objectives and of the potential for liaison with existing projects and thematic developments where appropriate. Successful applicants will be expected to collaborate fully with the TLRP Directors' Team and to participate in Programme activities throughout the life of the Programme, including those arranged as a part of the Programme's Communication and Impact Strategy. They will be required to produce an annual progress report for consideration by the Directors' Team and Steering Committee and a final end of award report which will be subject to interdisciplinary peer review through ESRC's evaluation procedures.
20. For further information on TLRP, please see the Programme's website at: www.tlrp.org.

Aims and Scope of the Call

21. *Definitions:* Within this Call 'technology enhanced learning' (or e-learning) is intended to cover the co-evolution of understanding of advanced digital technologies and learning or the support of learners in informal and formal settings. 'Learning outcomes' may be interpreted broadly. For instance, it includes both the acquisition of skill, understanding, knowledge and qualifications and the development of attitudes, values and identities relevant to a learning society.
22. *Aims:* This call is designed to support innovative interdisciplinary research collaborations focusing on the creation, development and exploitation of digital technologies for learning through a better understanding of their capability to transform the quality of learning experiences and lead to enhancements in learning outcomes (broadly conceived). Projects selected for funding are likely to entail greater risk or require more analytic depth than the normal operation of the technology enhanced learning market would provide.
23. *Interdisciplinarity:* Authentic *interdisciplinary* integration and innovation is sought. The research questions central to this call require interdisciplinary teams that bring together understandings of both learning and technology and draw upon perspectives from many disciplines in the social, cognitive and technological sciences. The focus for applications should explicitly remain on the complex research questions that are challenging enough to need high level innovation from a *combination* of such disciplines.
24. *User engagement, knowledge transfer and impact:* Users, stakeholders and potential beneficiaries should be engaged with the research at all stages, including conceptualisation and design, and may be members of consortia. Applications should demonstrate anticipated strategies for knowledge transfer, application and renewal to the education profession, the learning technologies industry, policy-makers and educational practitioners.

25. *Cumulation of knowledge:* Applications will be expected to draw on and extend existing knowledge in relevant fields. For example, potential applicants may wish to review the issues being studied and the findings being generated by other recent investments in e-learning and education by funders such as: JISC, HEFCE, SFC, HEA, DfES, Becta, NESTA, AHRC and the EU as well as EPSRC, ESRC and TLRP (see Annex 1).
26. *Sectoral foci:* Proposals may or may not focus on any single age or stage of learner, and could draw across different sectors, subject disciplines, age-groups, and places of learning, including informal and community-based learning, workplace learning, and home-based learning. Proposals may therefore target a wide range of users and beneficiaries. However, expected audiences and the intended benefits will need to be clearly identified.
27. *Research quality:* Proposals will need to demonstrate appropriate theoretical frameworks and rigorous research methodologies, capable of generating findings of clear value to their users and beneficiaries. The incorporation of explicit indicators of learning and other outcomes within research designs will be expected.
28. *Capacity building:* This funding initiative is intended to support UK academic communities and their user partners in building substantial and sustainable capacity for ongoing interdisciplinary research on technology enhanced learning. Proposals should demonstrate how they may contribute to this, for instance, by supporting new researchers in the field, extending forms of interdisciplinary expertise, or strengthening links between researchers, learning, teaching, training and support staff and ICT designers and developers.
29. *Substantive foci:* Applications under this Call should consider how technology enhanced learning can contribute to one or more of the challenges to the research community identified for this Call: *Personalisation, Inclusion, Flexibility and Productivity*. In addressing these challenges, all domains of learning are of interest, including curricular subjects associated with formal educational settings and the knowledge and skills called for in workplaces and informal settings across the lifecourse, including community-based learning and learning at home. The overall portfolio of successful investments is expected to address a wide range of types and contexts of learning.

Research challenges

30. The research challenges which have been identified for this Call reflect four major influences:
 - Academic consultation: ‘An e-learning Research Agenda’;
 - Major themes of TLRP;
 - Policy priorities of users and stakeholders such as government departments and funding bodies;

- Potential of this initiative to make a distinctive contribution to addressing key research challenges and to add value to other activities by supporting cross-Council interdisciplinary research in partnership with potential users and beneficiaries
31. The four challenges, as described below, are intended to focus this first call on a number of key strategic issues where there is a need for interdisciplinary insights, but the text describing each challenge is not meant to be prescriptive. Innovative proposals approaching these issues in different ways are welcome. The themes should not be seen as being mutually exclusive and bids may address more than one theme.

Personalisation: Transforming the quality of learning and teaching by exploiting the responsive and adaptive capabilities of advanced digital technologies to achieve a better match with learners' needs, dispositions and identities.

32. Research under this theme will explore how digital technologies can help to match the needs, abilities, aspirations, and circumstances of learners and learning communities through personalised technology and services in order that more learners are able to achieve a higher order of learning outcome, especially at basic skills levels and at higher levels. It will explore issues such as how technologies can be developed and used to connect learners to networks of others and to derive social support in learning processes and to enable learners to make informed choices about their own learning and to learn where, when and with whom they want, in ways that suit their approaches to learning and learning identities. Approaches to providing learners with easy access to a personal learning environment that offers culturally, educationally and psychologically appropriate tools, resources, and support for their learning will be explored.
33. We look for proposals that tackle the interdisciplinary research challenges that will contribute to achieving this objective to a degree that would be impossible without technology enhanced learning, e.g.
- that develop the interoperability standards and technologies needed to achieve seamless and personalised support for learners at any stage in their formal and informal learning, e.g. new forms of naturalistic multimodal interfaces to improve the quality of on-line communication and collaboration; new techniques for augmented individual and social cognition;
 - that use research into learning strategies and other approaches to learning, user profiling, recommender systems, learner modelling, and personal development planning, to support effective tools and services that are capable of matching individual needs, abilities, interests, dispositions and identities, and of yielding a higher level of personal performance;
 - that link an understanding of the social and cultural benefits, and the associated challenges of safety, security and privacy, of personalised learning to innovative technical solutions;

- that develop ways of networking individuals and groups of learners to achieve new, socially appropriate forms of challenge and support in learning;
- that use an understanding of the implications of personalised learning to investigate innovative solutions for new areas of curriculum development, and for new and more challenging forms of assessment.

Inclusion: Improving the reach of education and lifelong learning to groups and individuals who are not best served by mainstream methods.

34. This theme will explore how digital technologies can be used to support learners who are exceptionally talented, who have become disaffected from learning or who are otherwise unable to study to achieve enhanced learning outcomes and progression. How can technology enhanced learning - excite and stretch high achievers; motivate excluded learners through more engaging learning experiences that scaffold progress into more challenging learning opportunities; provide greater accessibility to learning technologies for learners with physical disabilities; support learners with cognitive disabilities to enable them to achieve their learning ambitions; provide higher quality access to learning for learners at times and places of their choice, in association with appropriate others, at any stage of learning?
35. We look for proposals that tackle the interdisciplinary research challenges that will contribute to achieving such objectives through technology enhanced learning, e.g.:
- that bring experts in mobile and pervasive computing together with social science researchers and educational designers, to envision new environments for learning that allow people of all ages, backgrounds and capabilities to learn where, with whom and when they have a need or curiosity, e.g. developing and testing new, context-aware, mobile technology, or the design of learning spaces in museums, parks, heritage centres and rural or urban environments that support people's personal learning projects;
 - that develop accessibility standards and technologies that are straightforward to adopt, and will enable TEL systems to diagnose responses and adapt to all learners, whatever their access, learning needs and circumstances;
 - that develop the design principles and prototypes that will help disaffected learners or those with cognitive disabilities to make faster progress and achieve greater accomplishment of basic skills and concepts, than may be possible otherwise;
 - that build on research in cognitive science, teaching and learning, and the practice of digital content design for games, simulations, creative tools, etc, to develop design principles, learning formats, and prototypes to help progress towards a generation of TEL products which are capable of high levels of

differentiation in learning challenge and which engender strong learner engagement.

Flexibility: Enabling the provision of education and skills to be deployed in more open, variable, and accessible ways, so that learning opportunities are available in a more seamless environment that can link classroom, home, workplace, and community.

36. This challenge is concerned with how users (learners, teachers, support staff, curators, curriculum designers, system designers and builders) can be supported to deploy advanced digital technologies for their own purposes in schools, colleges, universities, the workplace, communities, or at home, to create personally meaningful and rewarding learning experiences. Research could examine, for example, how teachers and support staff can be supported to collaborate across sectors in communities of practice facilitated through advanced technology applications.
37. We look for proposals that tackle the interdisciplinary research challenges that will contribute to achieving such objectives through technology enhanced learning, e.g.:
 - that develop new techniques and metaphors to understand and support learning communities combining both human and computational agents, including the discovery of new learning communities, support for community memories, new forms of augmented cognition, theories and techniques to allow learning and reasoning over uncertain and incomplete knowledge;
 - that use innovative forms of computer-supported collaboration to build tools, methods and techniques to support the design, development and deployment of large-scale learning facilities, to support teachers and learners collaborating and sharing across different learning facilities at varying scales, from personalised learning structures to larger organisational, disciplinary, cross-cultural, and international structures;
 - that explore new forms of naturalistic and multimodal interface that can support distributed, transient and mobile communities of learners, whether at a distance, or co-located, synchronous or asynchronous, through a variety of different interaction devices;
 - that develop the educational and learner-focused requirements for the design of open TEL architectures, a common core of technical standards for all publicly and privately funded technology enhanced learning, and the means and methods to cope with legacy systems, and support re-usability;
 - that take advantage of open source methods to share software innovation and development with the wider, interdisciplinary community.

Productivity: Achieving higher quality and more effective learning in affordable and acceptable ways

38. For technology enhanced learning to become embedded in mainstream education, there need to be rational economic and social models for its use – and these need to be culturally and politically acceptable. Greater public understanding of the different kinds of value that technology enhanced learning offers is likely to be a precondition for widespread and sustainable adoption. Research under this heading will assess the extent to which both learners and teachers can achieve more with the time they invest, the sustainable economic use of technology enhanced learning, and the technology diffusion rates and socio-cultural processes of adoption in, and beyond, conventional education and training settings. The intention is to inform the development of practice and investment policy in this field. In particular, proposals are invited which contribute towards an evidence-informed cost-benefit analysis of the personalisation of learning through technology across the life-course.
39. We look for proposals that tackle the interdisciplinary research challenges that will contribute to achieving such objectives through technology enhanced learning, e.g.:
- that demonstrate the social and cultural conditions and technological environments most likely to improve productivity of practitioners' and learners' time by facilitating reuse, collaborative development and sharing of technology enhanced learning resources, and by improving the personalisation of the learning experience;
 - that build economic modelling practice capable of assessing the principal forms of value offered by the most innovative technology enhanced learning against realistic costing models, to inform evaluations of investment returns and future investment policy for technology enhanced learning;
 - that develop the specifications for a common systems framework, making it possible to plan the continual development and adoption of data, technical and interoperability standards for TEL products and services.

Funding available

40. The funding bodies have provided approximately £6m funding to support this first call for a new phase of work under the TLRP. It is anticipated that this will support a limited number (approximately 3-5) of large, adventurous teams or consortia that are able to demonstrate clear interdisciplinary potential and strong user partnerships plus a number of smaller developmental awards as well as Programme-level co-ordination, communication and management arrangements. Research projects will be selected in two rounds of bidding. It is anticipated that a second call of similar size will be issued in 2007. This second call will allow more time for other teams, including those funded with capacity and development activities under the first call, to form new interdisciplinary and user relationships for the purpose of bidding.

41. Outline applications for large projects under the first Call should be for between £0.5m and £1.5m 100% full economic costs at current prices of which the Research Councils will meet 80% and for periods of up to 4 years (see ESRC Funding Rules 3.1.2 at <http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/opportunities/research%5Ffunding/>)
42. Full proposals for capacity building / development awards should be for between £15,000 and £60,000 100% FEC (of which the Research Councils will meet 80%) and for periods of up to six months. It is hoped that such awards will, where appropriate, facilitate the development of new partnerships or interdisciplinary research agendas and, where appropriate, to the submission of proposals to the second Call. However, it is also hoped that capacity building / development activities will themselves lead to outcomes and outputs of value in their own right in terms of building interdisciplinary research capacity, strengthening research-user partnerships and/or developing the research field, even if further follow-up work is not funded through the programme. Applications submitted under the second Call, which emerge from development awards, will be considered on their individual merits in open competition with other applications and will not be given priority for funding.
43. Collaborating partners could be within an institution, or come from other education and training organisations, or where appropriate, from the digital technology industry or existing TLRP projects. Proposals involving co-funding or contributions in kind to the research will be welcomed. Where appropriate, the costs incurred by user partners in contributing or carrying out the research may be included in the proposal where this is integral to the research design. Research consortia are not required to be multi-institutional, but must be interdisciplinary and include appropriate arrangements for engaging with 'user' partners. Education and training organisations could for example provide essential expertise and experience, perspectives on user requirements and fieldwork testing opportunities. The exchange of knowledge between all participating partners in a project will be one of the expected outcomes and applicants should describe how this will be supported.
44. Applicants for large research projects may wish to include provision for linked interdisciplinary doctoral studentships provided that the outlet at which they would be based is eligible to receive either EPSRC or ESRC studentship funding. Up to three studentships can be applied for on any single application. It must also be clear that the studentship is not displacement for the normal research support required on the grant. The student must have a distinct, independent, interdisciplinary area of enquiry that will add value to the overall research objectives of the grant. The case for such a studentship will need to be set out in an additional section in the Je-S full proposal. Such students will also be expected to complete their PhD within four years, as with ESRC standard studentships. Studentships are not costed under FEC arrangements, but if awarded, the grant will meet the full 100% cost of the normal provision. Further information on

applying for linked studentships can be found in the ESRC guidance notes at: http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/opportunities/current_funding_opportunities/

45. Applications will be expected to show, where appropriate, an undertaking to engage with other relevant research and development initiatives and such bodies as the UK e-Science community (for example, through the network of e-Science centres including the National e-Science Centre in Edinburgh) and the e-Social Science community (through NCeSS), as well as the international community, through, for example, the Global Grid Forum).
46. Applicants are advised to check the eligibility of any costs requested under ESRC Research Funding rules (available from the ESRC website) before applying.
47. Normal *ESRC Research Funding* rules will apply to all awards.

Development of Proposals

48. This competition will take place in several stages, to facilitate the cross-fertilisation of different discipline areas and partnerships needed to meet the research challenges, to build workable teams, and to ensure a healthy community for viable research collaboration.
49. The main stages are expected to be as follows:

Stage 1: Appointment of TLRP Acting Associate Directors for e-learning to support applicants with the development of proposals

Stage 2: Announcement of Call followed by briefing events facilitated by the newly appointed Acting Associate Directors for e-learning. Applicants seeking partners or wishing to seek comments on their research ideas will be given an opportunity to post details on the TLRP website for open comment across the research and user communities from March to May 2006.

Stage 3: Closing date of 12 May 2006 for the first call *outline* proposals for large projects from interdisciplinary project teams or consortia (with likely partners indicated) and *full* proposals for development awards.

Stage 4: Shortlisted outline proposals for large projects notified in July 2006.

Stage 5: Small capacity building or development awards start from autumn 2006.

Stage 6: Final proposals (which identify interdisciplinary partners and early adopting users) for first call large grants to be submitted by October 2006.

Stage 7: Selection of first round large projects in January 2007.

Stage 8: Anticipated start date for first round large projects of spring 2007. Appointment of TLRP Director for e-learning for duration of the e-learning programme.

Stage 9: Announcement of second call for large research proposals in April 2007.

Assessment of Applications

50. Outline proposals for large grants and full proposals for capacity building / development activities submitted by the deadline will be considered by a specialist Commissioning Panel comprising of selected members of the TLRP Steering Committee and external experts in technology enhanced learning chosen by ESRC and EPSRC from both the research and user communities (representatives of funding bodies will also attend in a non-voting capacity). Proposals will be ranked against the criteria for the Call. A small number of outlines will be invited to submit full proposals and those small capacity building awards judged to have the greatest potential to lead to activities which will meet the criteria outlined below will be recommended for funding. Teams or consortia will be informed of this decision by July 2006 and will be required to submit full proposals by late October 2006. Successful small capacity building full proposal applicants will be informed by July 2006 and it is hoped that they will be able to start work from autumn 2006, subject to agreement of award details.
51. Shortlisted full proposals for large projects will be assessed by referees selected jointly by the ESRC/EPSRC in consultation with other partners as appropriate using ESRC's standard peer review procedures. At least one of these referees will be chosen from amongst those nominated by the principal investigator. Proposals will then be considered by the specialist commissioning panel which will make recommendations to the Councils on the priorities for funding.
52. When considering both outline and full applications, particular attention will be paid to the following research criteria:

Contribution and fit to the TEL Call. Does the proposal display an appropriate fit to the overall aims of the TEL Call? Is there creative engagement with the challenges to research defined in the TEL Call?

User engagement and partnership. Does the proposal include strong collaborative partnerships and appropriate user engagement with relevant policy-makers, practitioners and potential adopting organisations throughout all stages of the research? Is there evidence that relevant partners have been engaged, as appropriate, in the development of the proposal?

Interdisciplinarity. Has interdisciplinary collaboration and integration between the social and technological sciences been successfully established within the research design? Does the proposal make a good use of the opportunities to achieve added value through interdisciplinary collaboration in ways which make a significant contribution to the development of interdisciplinary research in the field?

Contribution to knowledge. Is the proposal grounded in a thorough review of the extant literature in relevant fields? Does the proposal have a coherent theoretical and analytical framework? Is it likely to make a significant contribution to the development of the current interdisciplinary research knowledge base?

Research Teams and Project Management. Does the proposal indicate that the project team or consortium has the skills, expertise and time necessary to bring the research to a successful conclusion? Does the proposal have a clear, well-designed and robust project management structure capable of supporting the proposed partnerships, interdisciplinary integration, successful collaboration, and delivering on the specified work programme?

Research Design and Methods. Does the proposal clearly and fully describe a research design and schedule appropriate for the achievement of the stated research objectives? Is the project time-scale appropriate to the research design? Are there rigorous methods for assessing learning outcomes (broadly conceived)? Are there realistic proposals for data collection and data analysis? Has careful consideration been given to ethical issues?

Contribution and fit to TLRP. Does the proposal display awareness of the overall aims and objectives of the TLRP? Where appropriate, does it attempt to build on existing work from the Programme? Is there a thoughtful commitment to active participation in the Programme as a whole?

Contribution to Research Capacity Building. Is there a commitment to helping to build research capacity in interdisciplinary research in the field of technology enhanced learning?

Communication, Knowledge Transfer and Impact Plans. Is there a well-developed project communication and impact plan, which would make a significant contribution to knowledge transfer? Is there a clear statement of the anticipated outputs appropriately targeted at a range of potential academic and non-academic audiences? Is there a coherent strategy for addressing sustainability and for maximizing the chances of product adoption, where appropriate?

Value for money. Does the research represent value for money relative to the likely outcomes? Are the resources requested necessary and adequate for the effective conduct of the research as outlined, including proposals for communication and impact?

Submission of proposals

53. Applicants are required to submit their application using the correct outline or full proposal template on the Research Councils Joint Electronic Submission system (Je-S). Postal or other forms of submission are not possible.
54. If you and your research organisation are already registered for Je-S, electronic applications can be accessed via the central Je-S web site at <https://je-s.rcuk.ac.uk/>.
55. Organisations wishing to register for Je-S should contact Je-S Helpdesk at JeSHelp@rcuk.ac.uk. Tel: 01793 444164 (open 9am to 5pm weekdays, except holidays). Users wishing to access the Je-S system for the first time are asked to check with their central administration on the status of the organisation's Je-S

registration before pursuing the option of creating an account through the Je-S system. Non-JES registered users are urged to ensure that they are registered at an early stage well in advance of the closing date and not to leave completion of the application and submission through the Je-S system too close to the deadline.

56. Please read all instructions / help text when using the Je-S system this form. If you require technical support on the use of Je-S please contact the helpdesk (see contact details above). The Je-S helpdesk should also be the first contact point for queries regarding the move to full economic cost proposals. Please note that this helpdesk can only address technical questions relating to use of the Je-S system and the introduction of FEC.
57. For further academic information and details of briefing meetings in London, Edinburgh and Cardiff, please view: <http://www.tlrp.org/tel>

Questions regarding the scientific remit and objectives of the Call should be addressed to a member of the TLRP Acting Associate Directors' Team or to the team as a whole:

Dr Richard Cox (richc@sussex.ac.uk)

Professor Diana Laurillard (d.laurillard@ioe.ac.uk)

Dr Lydia Plowman (lydia.plowman@stir.ac.uk)

Professor Josie Taylor (j.taylor@open.ac.uk)

The TLRP e-team (e-team@groups.tlrp.org)

General enquiries should be addressed to the TLRP Office at: tlrp@ioe.ac.uk or to the Director of TLRP:

Professor Andrew Pollard (a.pollard@ioe.ac.uk)

58. Questions regarding the commissioning process or other research council queries should be addressed to ian.farnden@esrc.ac.uk
59. Electronic submissions must be despatched to the ESRC through JES for receipt by 16.00hrs on 12 May 2006.. Please note that hard copies are NOT required.
- 60. This deadline will be strictly enforced. Applications submitted after the deadline will NOT be accepted. Applicants are strongly advised not to leave completion and despatch of applications to the last minute.**

ANNEX 1: Links

A number of documents were considered in the preparation for this Call.

Becta, *Review 2005: Evidence on the Progress of ICT in Education*,
<http://www.becta.org.uk/research/>

DENI, *emPowering schools in Northern Ireland (2004)*,
<http://www.empoweringschools.com/>

DfES, *Harnessing technology: Transforming learning and children's services (2005)*,
<http://www.dfes.gov.uk/publications/e-strategy/>

HEFCE, *Strategy for e-learning (2005)*,
http://www.hefce.ac.uk/pubs/hefce/2005/05_12/

JISC, *The e-Framework for Education and Research – an Overview*, <http://www.e-framework.org/resources/eframeworkV1.pdf>

JISC, *Designing for Learning: an update on the Pedagogy strand of the JISC e-Learning Programme*, www.jisc.ac.uk/elearning_pedagogy.html

Josie Taylor et al, *An e-learning research agenda (2005)*,
<http://www.epsrc.ac.uk/CMSWeb/Downloads/Other/E-learningResearchAgenda.pdf>

Scottish Funding Council, *E-learning and transformational change*. (Information about a £6million programme to embed e-learning in HE/FE, 2005-2007)
http://www.sfc.ac.uk/information/information_learning/transformational_change.html

National Assembly for Wales, *The Learning Country (2001)*
<http://www.wales.gov.uk/subieducationtraining/content/learningcountry/tlc-contents-e.htm>

ANNEX 2: An e-Learning Research Agenda

A consultation across the UK academic e-learning community identified research areas that are in particular of collaboration across the social/educational and technical/computing research communities. In summary, these were:

Modelling and dynamic evaluation: e.g. deriving, building and testing models of learners and teachers as individuals and as group members that can be distributed across different devices and contexts; designing technical systems that meet social demands of privacy; designing systems that meet pedagogic requirements of different granularities of descriptions of learning, and different timescales of learner information, from seconds to years; designing educational computer games to inform our understanding of, for example, the nature of ‘engagement’ and ‘flow’ etc.

Informal, Lifelong Learning: e.g. combining our understanding of learner needs, community behaviour, and innovative social and technical solutions to build and test systems that can personalise support at any age or stage, and provide continuity for the individual learner, no matter where or when they are learning; developing the technical solutions that support scalability of working prototypes for global teaching systems and interoperability; understanding the technical requirements that best facilitate and support learning communities, and communities of practice.

Creativity and Problem Solving: e.g. development of new kinds of ICT tools to support creativity, exploration, experimentation, collaborative engagement, search, retrieval, and information classification; finding the interface design solutions to meet the challenges set by education in the creative arts, maths and sciences; designing and testing novel ways to represent and engage with complex ideas; finding technological solutions to supporting the social requirements for successful collaboration.

Inclusion and Accessibility: e.g. making affordable the forms of inclusive accessible learner-centred design that challenge current forms of HCI; technical solutions to support learners with limited literacy, language or cognitive skills in access meaningful learning resources and experiences; finding design solutions that support learners outside the mainstream in truly intuitive, empathetic means of interaction; understanding the psychological and social requirements, and developing appropriate technical solutions, for bringing reluctant users into the digital world.

Underpinning these themes are two cross-cutting multidisciplinary challenges in e-learning:

Technological challenges in e-learning: how do we exploit the potential that emerges from new technological advances to best support e-learning?

Economic, social and cultural challenges for e-learning: How do we ensure that the benefits to emerge from e-learning are exploited to their best potential and how do we understand and manage the social and cultural impact of e-learning research and practice?

For the full text of the report, please see

www.epsrc.ac.uk/CMSWeb/Downloads/Other/E-learningResearchAgenda.pdf