

ALT RESEARCH STRATEGY – 2005

Introduction

1. At the heart of the ALT overall strategy and philosophy is the importance of research to underpin the effective deployment of technology in support of the learning process in higher education (HE) and further education (FE) and more generally. ALT believes there to be an ongoing requirement to bring together researchers, practitioners, developers, and resource controllers in order to ensure effective deployment. Only in this way can “embedding” of e-learning, sought by the funders, be achieved.
2. This document gives the ALT strategy for Learning Technology (LT) research. It was first presented and discussed in summer 2004 at the ALT Research Policy event and subsequently at ALT-C 2004. Further comments have been made from a number of sources and these have been carefully considered in drawing up this version.
3. A number of other strategies for LT research and related roadmaps have appeared in the UK. These include work of the Research Councils, JISC, and of the e-Learning Research Centre (eLRC) as well as major strategic documents from DfES and HEFCE. It is pleasing to note that the ALT strategy has proved congruent with all of these although different emphases and priorities are inevitably placed on actions by different bodies.
4. Much research in LT has been accused of being irrelevant or failing to address the problems facing practitioners or resource controllers. Whilst some of this criticism is well founded, the majority stems from the inevitable abstraction and choice of language of many researchers and also from a frequent lack of understanding, especially by developers, of institutional contexts. As an organisation seeking effective and ongoing deployment, the ALT strategy attempts to put research questions in a form and language to which institutional management will relate whilst still allowing the other groups to see their work as clearly included.
5. The next three sections constitute the bulk of the strategy. Firstly, there is a discussion of the nature of the relationship between Learning and Technology.
6. Secondly, eleven key questions are suggested which are of common interest to researchers, developers, practitioners and above all institutions in the use of LT and could form the basis of common discourse. These are presented as research questions in a form that is essentially independent of pedagogy and technology. They are presented in a loose order of increasing learning focus (and hence decreasing technology focus).
7. Thirdly, some recommendations are provided for ALT and all those associated with it whether as members, HE Institutions and FE Colleges, national bodies, and other members.
8. One argument for a growing maturity of a discipline is the widening of the gap between leading edge research and industry practice. For this to work there has to be an agreed set of knowledge, values and skills that are used by practitioners and are grounded in research. That is addressed by other ALT strategies but is itself key to implementation of this one.

Relationship between technology and learning

9. Internationally the last 30 years have seen a retrenchment in FE and HE learning driven by a combination of the changing expectations and styles of learners, the availability of new resources and technology, and by costs in a mass system. Technology has often played a role, especially on the administrative side.
10. In this environment it is tempting to view the relation between learning and technology as one that is completely led by learning. It is equally tempting to view teacher centric learning as essentially technology led and learner centric learning as primarily pedagogy led. Whilst modern education literature strongly favours a constructivist approach and LT can help support that, technology can still

influence learning. Specifically, it is pointless designing structures that cannot be delivered within the technology envelope available (quality, quantity and cost).

11. The industries that adopt early new technologies such as speech, writing, positional number, calculus, printing, photography, video, computing and communications, are usually from the same set - warfare including simulation, games/leisure, the sex industry, and combinations of these. Mass learning is traditionally late as a widespread adopter: proper trialling and testing are needed for fairness and quality assurance reasons. Nevertheless some technology, especially assistive technology such as speech recognition and virtual microscopes, seems initially to demand its use so as rapidly to improve learning opportunities for a wider community.
12. This leads to the LT researcher's dilemma. Researchers are not bound in their own learning by the same learning constraints that are considered the norm for mass education. They often seem to have choices between exploiting technology without a thought-through pedagogic base using technological language and terminology that are not generally understood, or staying completely within a firm pedagogic footing in a strongly evaluative culture working largely with technology that substantially lags the leading edge (BBC micro culture), whilst using pedagogical language and terminology that are not generally understood. Subject based practitioner developers sometimes do the former without being aware of the dilemma or the pedagogical considerations. Resource controllers do not seem to find either approach helpful.
13. ALT believes that there is a "third way" and that there is a genuine formal relation between pedagogy and technology. New technologies should cause thought as to whether they can help if sensibly deployed and new pedagogical thought should lead to thought about what technologies may help with deployment. Learning Technology research should therefore focus on the interplay (relation) between learning and technology and is a relatively new area of study, at the join of Education and CIT. New areas have arisen before by being a similar relation between two existing disciplines. For example Computer Science arose as a relation between electrical engineering and mathematics, with neither dominating. When new areas arise in this way there is usually a period when the two "sides" both believe that they lead.
14. The related question is whether Learning and Technology are sufficient or whether there are further equal areas of partnership leading to a three or greater dimensional relation. Some suggestions have been made including culture and ethics, and costing and finance. Currently ALT views these important areas as being capable of being inherited from their existing roles within education or technology and incorporated rather than playing an independent relational role: we will keep this under review.

Eleven overarching questions facing researchers, practitioners, developers and resource controllers

15. Given that both the technologies available and the pedagogies in fashion vary with time, standard abstraction techniques suggest that in studying the relation between them, bringing together pedagogies with appropriate technologies, we should look to identifying aspects of the relation that do not vary with time – are there ongoing aspects of enquiry that are independent of both pedagogy or technology? The ALT strategy identifies eleven such but there may be others.
16. Any given piece of research will address one or more of these questions in a situation of specific learning and technology. We suggest that the principles and techniques used will also be largely independent of that placing and form the basis of the skills and knowledge that practitioners need.
17. Accordingly, each of the questions has associated with it a set of related principles, skills and knowledge that workers in the area should have and be able to apply. These could form the basis of the relevant part of a professional accreditation module.

Question 1: How do we deliver a personalised experience within a mass system?

18. Unless an educational system is capable of scaling up it will inevitably be too expensive and become moribund as soon as initial enthusiasm wanes. A lot of what currently passes for personalisation is only ‘skin deep’, and does not really help the learner beyond a psychological feel-good factor. There are two conflicting paradigms: mass education and the user expectation of a personalised learning experience. Research into how technology can continue to help resolve this conflict is required.
19. Principles here include the need for system design to support flexible user choice of presentation, and for learning content and learning management systems to inter-work effectively. Organisational requirements for a mass system are well known and have often been the major driver in the development of Virtual Learning Environments.

Question 2: How do we integrate new systems into existing environments?

20. Another way of putting this question might be “How do we move on from where we are?” New learning opportunities have to be introduced within existing “legacy” administrative, organisational, and learning systems. The interaction between them is currently seriously under-researched.
21. Principles here include the need for clean interfaces, for pedagogical join across the legacy divide, and for coherent related assessment and quality assurance (QA) regimes. Systems need to interface at different levels; we cannot completely redesign every time new technologies appear. Some interfacing will be brought about through standards, but we need research to identify the required characteristics, beyond routine ADL and SCORM/IMS. Handling legacy people and QA systems are especial problems needing more research and good practice guides.

Question 3: How do we make learning reusable?

22. Learning object research is currently top-down and design led, and standards are largely technology-oriented. The real research – which is harder – needs to focus on supporting wider reusability.
23. Principles here include the need for the definition and appropriate use of standards, the need for consistent user models, and embedded support for customisation and revision. Research and evaluation are needed into existing reuse, and robust institutional and discipline models of reusability should be developed and tested in order to understand the impact on learning.

Question 4: How do we deliver to a more global, diverse set of learners?

24. The issues of how to make learning accessible across a wide variety of sectors, ethnicities, cultures, learning approaches, and modes of study currently receives a lot of attention. However, there is a need to support achievement of the same learning outcomes for different learners. The globalisation of education exacerbates the disparities in learning approaches and attitudes to learning. Research is needed in how to support multiple cultures.
25. Principles here include the need to have a range of defined personae for user testing, and to understand and support a plethora of different learners. Western methodologies often rely heavily on a particular style and format of online tutorial support that is sometimes replicated without thinking through the cost and cultural implications. As blended learning becomes the new norm, we should be researching what blends work best across a range of sectors, disciplines and cultures.

Question 5: How do we make learning opportunities fairer?

26. The question of disparities of opportunities for learners is also currently at the heart of much research. As blended approaches and other paradigms are developed we can easily create “divides”. There have always been barriers to learning which partition societies into haves and have not. Technology is both solution and problem: whilst research inevitably uses and develops the latest technologies, it can also mitigate disabilities and disadvantages.
27. Principles here include the need for backward compatibility, support of low level technology, and the application of standards for accessibility. What is urgently needed in this area is bringing together the results of previous initiatives in order to define and structure future work.

Question 6: How do we ensure a good completion rate for the learning?

28. A major “divide” is that between those who achieve the learning outcomes and continue to “progress” and those who do not. Research shows that unsupported e-learners are particularly susceptible to problems of de-motivation and feelings of low support and morale leading to poor retention. The problem of how we engender and reinforce the confidence of learners in their ability to progress in a technology based environment needs considerable work.
29. Principles here include the need to identify points in the learning cycle when learners are most likely to drop out, and to provide the right range of support and scaffolding, including blended options. There have been many local studies, but little overall understanding has arisen from these about how eLearning differs from conventional learning in retaining students, motivating them and supporting students at risk. Research into what forms of support for students are most effective is needed.

Question 7: How do we devise and deploy appropriate assessment?

30. Assessment has often lagged behind innovations elsewhere in LT, perhaps because of legacy problems. We need diagnostic, formative and summative assessment processes reflecting the learning outcomes of technology-delivered education. Again, technology appears as part of both problem and solution.
31. Principles here include designing assessment alongside the learning, and using technology to support differing ways of demonstrating attainment of learning outcomes. We should be using technology to support more diagnostic assessment in order to identify for both the student and the teacher what students do and do not know. There is often a trade-off between rigour, efficiency, and fitness for purpose.

Question 8: How do we ensure cost effective efficient learning?

32. Assessment can be a major area of cost but the problem is more general. Research in effective course models needs enhancing by the inclusion of costing considerations.
33. Principles here include the need to have realistic marketing knowledge, knowledge of efficiency losses due to different activities, and a more accurate model of how choices of design affect the overall cost of the learning. Existing research into the costing of technology-based learning is not extensive.

Question 9: How do we build in quality assurance support?

34. There is a need to have designs that inherently support subsequent quality assurance processes. The existence of a plethora of local and national quality frameworks can make this a hard problem.
35. Principles here include the need to have learner-feedback mechanisms embedded in the learning, and escalation and other QA processes that are driven by performance indicators generated by the system rather than bolted on afterwards, and then fed into the appropriate QA system.

Question 10: How do we ensure student control of the learning?

36. Thinking in education in the UK has been driven over the past 20 years by the view that the learner should be increasingly in control of the learning and this has driven many models devised in the technology mediated area. We are just seeing micro activity emerge into institutional strategies and technologies.
37. Principles here include the need for managers, practitioners and developers to work coherently together on the provision of appropriate systems, informed by research. Identifying the potential of technology to support the shift is sometimes easier than actually doing it. We do not yet understand the relationship between teacher and student in the perpetuation of teacher-centred learning.

Question 11: How do we harness informal technology based learning to support formal learning?

38. A major driver of learner-centred activity is the practices of the learner in other areas of life. Online communities of practice, games and edutainment have all demonstrated significant learning outcomes. Research is needed to understand how these processes can be exploited in more formal situations.
39. Principles here include the need to identify drivers for user engagement with learning and the need to provide mechanisms that relate learning with other parts of life experience. The value of informal learning methods seems to be well understood and harnessed at Primary level, but the use diminishes with time and is rarely harnessed at HE level. There are clear sectoral differences that need explanation.

Example

40. As an exercise the reader might take a (technology, pedagogy) situation and map it to the questions. For instance e-portfolios bring together the technologies of databases and structured documents, assessment systems and QA systems, and the pedagogies of student directed learning, resource based learning and experiential learning. Portfolios are not a new method of assessment, but electronic portfolios extend the scope and benefits considerably. They provide the learner with on-going documentation of their learning that can easily support job applications and other activities. E-portfolio issues essentially address a combination of questions 1, 2, 4, 6, 7, 8, 9, 10, and 11.

Recommendations

41. Learning technology should be promoted as an emerging research area and supported with associated structures within the research councils and funding bodies with more widespread acceptance and use of a reviewing journal, accreditation of the learning technology profession etc.
42. There is a growing need for co-ordinated evaluations, which collect together smaller studies by practitioner researchers, in order to develop an understanding of the bigger picture and address the key questions of this paper. This needs core researchers who can cope with large distributed, possibly part time teams and trained part time researchers/evaluators in distributed, virtually connected communities. This model itself will become more common in this and other disciplines and needs to be better understood and supported by funders.
43. Using these co-ordinated evaluations, overview articles on each question detailing what is known, work in progress, existing specialists and so on, should be commissioned and disseminated widely.
44. A lot of ongoing work requires the interplay between researchers, developers, practitioners and other organisational powerbrokers – this kind of integrated work needs to be better understood and supported by funders.
45. Ongoing involvement of practitioners and developers in research design needs to be encouraged as it leads to better research. This should involve industry and the corporate sector where appropriate.
46. The evaluation of research needs greater recognition and support.

APPENDIX - ABOUT ALT

Aims

Formed as a Registered Charity in 1993, ALT is a professional and scholarly association which seeks to bring together all those with an interest in the use of learning technology¹. We aim to:

- promote good practice in the use of learning technology in education and industry;
- represent the members in areas of policy;
- facilitate collaboration between practitioners, researchers, and policy makers.

Activities

We organise:

- ALT-C, which is the UK's main conference for learning technologists - our 2005 conference will be here in Manchester between 6 and 8 September²;
- occasional conferences on topics of interest to learning-technology practitioners;
- visits and exchanges;
- workshops – for example on accessibility, and learning object design;
- an annual Policy Board – for example at our 2003 meeting the Secretary of State for Education and Skills launched the DfES's e-learning strategy consultation, and at our 2004 meeting, at HP Labs in Bristol, we consulted on this Research Policy;
- a certified member scheme for learning technologists - CMALT

We produce:

- regular responses to consultations relating to learning technology and e-learning;
- a fortnightly members' email digest;
- an international peer-reviewed journal devoted to research and good practice in the use of learning technologies, ALT-J;
- a quarterly Newsletter, ALT-N;
- publications aimed at practitioners, sometimes produced in conjunction with other organisations.

Organisation

Over 100 Universities, around 70 FE Colleges, and around 40 commercial and Government organisations are members, along with around 500 individuals. Our office is in Oxford. We have 4.5 staff. 4 practitioner committees (Further Education, Membership, Events, and Publications) reporting to the Central Executive, decide ALT's policy and direction.

¹ ALT understands learning technology as the systematic application of a body of knowledge to the design, implementation and evaluation of teaching and learning. The body of knowledge, the fruit of research and practice, is based on principles of learning theory, instructional design and change management, but is grounded in an understanding of the underlying technologies and their capabilities. Thus: *learning technology* is the use of a broad range of communication, information, and related technologies to support learning and teaching, and *learning technologists* apply learning technology in practice and/or do research into learning technology.

² <http://www.alt.ac.uk/altc2005/>