The Training of Teachers and Trainers: Innovative Practices, Skills and Competencies in the use of eLearning

David E. Gray (University of Surrey, UK) [D.E.Gray@surrey.ac.uk]
Malcolm Ryan (University of Greenwich, UK) [M.Ryan@gre.ac.uk]
Arnaud Coulon (Algora, France) [arnaud.coulon@algora.org]

Abstract

This article reports on the results of a study undertaken into innovative practices in the development and uses of eLearning for teachers and trainers, and the activities, competencies and roles used in such practices. 25 case studies were purposively selected across 7 countries and included both small scale and large scale projects, including some with a national focus. Results revealed that in nearly half of the projects blended learning was the strategy of choice, but that other approaches included virtual classrooms, tele-teaching and collaborative learning. A diversity of strategies towards the management of e-Learning projects were revealed, with some organisations struggling when moving from single authored to team delivered projects. In terms of instructional design, no definitive answers emerged as to what pedagogical approaches were being adopted, projects often demonstrating a common-sense approach. But it was clear that the growth of e-Learning has resulted in the development of new skills and competencies and novel ways of putting them to work in project teams. This includes ways of exploiting the new technology and how to manage the special problems arising from contact with learners who are at a distance. A number of key recommendations are made for practitioners and policy makers.

Keywords:

E-learning, competencies, blended learning, eTutoring

INTRODUCTION

eLearning has been described as the 'use of electronic technology to deliver, support and enhance teaching and learning' (Learning Technologies, 2003). Strong optimism for its growth contrasts sharply with some of the experiences of consumers. Massy (2003) reports the results of a European survey conducted by CEDEFOP in 2002, which found that 61 per cent of respondents rated the quality of eLearning negatively – as 'fair' or 'poor', while a mere 1 per cent rated what they had experienced as 'excellent' and only 5 per cent 'very good'. Another survey reports that, 'Early on we witnessed a series of claims that eLearning was the ultimate panacea, but ... many commentators are suggesting that this early optimism was grossly misplaced' (CIPD, 2003: 1).

ELearning has progressed through a number of stages and transformations over the past thirty years. In the 1970s and 1980s, for example, it was referred to as Computer Assisted Learning, Computer Based Training or Technology Based Training. Pedagogically, early programmes often involved electronic page turning and were didactic in approach – a form of **transmitted knowledge** (Gaimster and Gray, 2002). Siegel (in Sensiper, 2000) distinguishes between three generations in the development and sophistication of these kinds of eLearning programmes. In the first, web sites consisted largely of text-based pages with hypertext links. The second generation saw the inclusion of graphics and video, which Siegel denotes as 'thin multimedia'. In the third generation the visual, auditory and textual material flow, interact and enhance each other in a coherent, holistic fashion.

By the 1990s this form of learning was beginning to be supplemented by the use of other media, particularly the introduction of e-mail, listservs and discussion groups. Although courseware continued to be used, this was often accompanied by a discussion forum through which participants could read and post messages, and become involved in mutual support and debate. In a sense, this could be seen as **negotiated knowledge** (Gaimster and Gray, 2002). Today virtual learning environments (VLEs) comprise facilities for both the management of course materials and interaction via a range of communication tools.

Looking forward, there are important changes taking place in web development that could have a significant impact on the way in which it is employed for teaching and learning. It is growing exponentially and now includes millions of pages, sites archives, portals and databases. In the future, we may be moving away from using the web to deliver knowledge, and developing in people the research skills and capabilities for searching the web. This has been characterised by Gaimster and Gray (2002) as **harvested knowledge**.
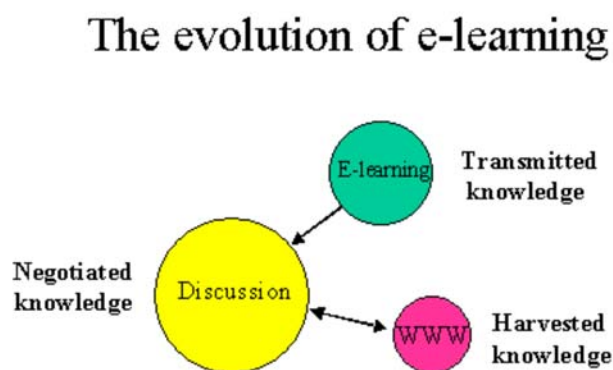
The evolution of e-learning

Figure 1 The evolution of eLearning from transmitted to negotiated and harvested knowledge (Gaimster and Gray, 2002)

In recent years, it has been recognised that eLearning is not merely another medium for the transmission

of knowledge but that it changes the relationship between the teacher or trainer and learner. It requires new skills, competencies and attitudes amongst those planners, managers, teachers and trainers who are going to design and develop materials and support learners online. In short, the development of innovative practices and the generation of new competencies in eLearning are fast becoming key issues for teacher and trainer training.

It is against this background that CEDEFOP created TTnet in 1998 as a network of national networks to act as a forum for discussion and co-operation amongst key national players and decision-makers in the field of the training of teachers and trainers. The research project discussed here represents part of TTNet's contribution to having a better understanding of and addressing some of the issues as outlined.

RESEARCH OBJECTIVES

The purpose of the project was to find examples of 'innovative practice' in the training of trainers using eLearning and identify the range of activities, competencies and roles involved in such practice. Innovative practice was defined as:
Initiatives, projects and activities that have a tangible impact on improving trainers and/or teachers' skills, professionalisation and working environment; and proven to be sustainable in their social, pedagogical and organisational components and/or through lasting changes in policy and decision-making.

In order to fulfil the aim of the project, a number of research objectives were specified, namely to:

- Identify examples of innovative practice for the training of trainers/teachers with specific reference to eLearning.
- Describe the approaches to the management of innovative projects.
- Identify the kind of pedagogic principles and models of learning (whether tacit or overt) underpinning effective design.
- Describe and analyse the originating circumstances (by which is meant the context, specific learning or organisational needs) threats and opportunities that have driven the innovation.
- Identify the types and scale of output.
- Present an impact analysis arising from the examples of innovative practice (and the potential for transferability and scalability).
- Identify and describe the activities, competencies and roles involved in innovative practices.
- Identify and describe the evolution of competencies of trainers, their professionalisation and work environment.

RESEARCH METHODOLOGY

The purpose of this study was to get to the heart of what is happening in terms of 'effective practice', providing detailed and, hopefully, illuminating data on innovation in eLearning development and implementation. It was felt that a case study method was ideally suited to these aims since it can provide a richness and layering of data that other approaches can not match.

Sample selection

Cases were chosen on their potential for yielding original and illuminating results as a guide to practice. A target total of 25 case studies were selected on the basis that this was feasible within the time and budget constraints of the project and because they offered a sufficiently wide base for developing comparisons and contrasts across the cases. The project was divided into two streams, one examining innovative practice and the other competencies. The innovations stream covered all 25 cases and the competencies stream selected those 17 cases thought to offer the best opportunities for examining skills and competency issues. The cases were selected to be representative of a variety of development roles (project managers, instructional designers, etc), cross section of organisational types and models of eLearning (for definitions used, see Appendix 1). Table 1 provides a summary of the sampling frame for the study and the size of the eventual sample (selected through quantitative and qualitative evaluation) for detailed interviewing.

Table 1 Sample selection across network leaders and associated networks

Country	Effective sample for issue of Case Study template	Sample chosen for Innovations project	Sample chosen for Competencies project
France (Network leader)	8	5	5
UK (Network leader)	10	5	3
Italy (Network leader)	10	5	5
Austria (Associated Network)	2	2	1
Belgium (Associated Network)	13	2	0
Netherlands (Associated Network)	7	3	0
Spain (Associated Network)	6	3	3
TOTAL	**56**	**25**	**17**

Figure 2 provides a schematic summary of the research process comprising:

- Design of the case study template and tools by the Transnational Consultants
- Issue of these templates and tools by Network Leaders (France, Italy and UK) and leaders of Associated Networks (Austria, Spain, Netherlands and Italy) to the identified cases
- Evaluation of the completed templates by Transnational Consultants, and from them, the selection of 25 case studies drawn from a predetermined sampling frame across the seven countries
- Issue of data gathering tools (Analysis Tool and Data Report Template) by the Network Leaders and leaders of the Associated Networks and the subsequent interviews and data gathering by National Experts (field researchers)

- Collection of the data, analysis and reporting by the Transnational Consultants
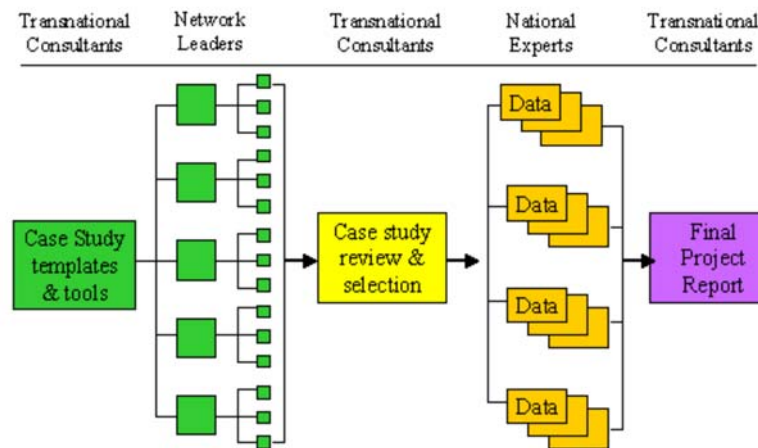

Figure 2 Overview of the research process

Data gathering tools & process

For the Innovations stream, given the intention of gathering illuminating data, it was decided to use a semi-structured interview schedule. The use of short, pre-determined questions allowed for the development of some standardisation and focus on the themes of the research. Through the use of open questions, the research tool was designed to elicit rich, 'thick' descriptions and detailed responses. The Competencies stream also made use of a semi-structured interview schedule, an open format questionnaire and a structured analysis grid outlining roles and activities in eLearning development.

RESULTS

What sort of projects took part in the study?

The research was successful in eliciting data from a wide range of projects in terms of scale, type and learning strategy. **Table 2**, for example, shows that, while nearly half the projects were small scale, dealing with less than 50 learners, an equal number dealt with more than 500 learners.

Table 2 Scale of projects in the research study

Scale	Total
<50	11
50-100	2
100-500	0
>500	11
No data	1
TOTAL	**25**

One project in Italy (Case Study 5: Indere), for example, had a potential target audience of 62.000 teachers and involved the use of 30 technicians including web designers and programmers to develop 25 hours of online material. There were as many as 4,000 people using the learning system at the same time while 2,400 tutors supported 54,000 learners.

At a more modest level the VOV Learning Square (Case Study 18) comprised a series of networked communities of corporate professionals (70% of the group) and training consultants (30%), with about 70 participants within 7 learning communities.

The largest project in the study (in terms of development budgets and size of target audience) was Case Study 22 (Knowledge Net) delivered via 11,000 locations. This was a government-sponsored project aimed at a broad range of educational sectors (primary, secondary, adult/vocational training). Its ICT system was accessed by between 50,000 and 100,000 people per day.

Concerns remain, however, that there may be a credibility gap between the large-scale aspirations of some projects and what they are currently able to deliver in terms of uptake. It was sometimes easier to identify the number of online learning hours developed and the time and resources used in their construction, than it was to quantify the number of people who had actually used the programme.

This is certainly not to argue that small-scale projects were of diminished value but there must come a time when eLearning can demonstrate scalability and rollout to large audiences at either organisational, sector, regional or even national levels. Currently, this is being achieved by a limited number of projects, with many remaining in the mould of 'interesting', 'experimental', 'groundbreaking' – but small.

Table 3 illustrates the types of project by learning strategy and reveals that in 40 per cent blended learning was the strategy of choice. Since this was the only strategy that includes an element of face-to-face interaction, it suggests that some form of direct human contact (with tutors or learners) is favoured by a large proportion of learners. Appendix 2 presents a brief description of each of the 25 case studies.

Table 3 Projects by learning strategy

Learning strategy	Total
Virtual Classroom	4
Tele-teaching	2
Blended Learning	10
Collaborative Learning	3
Supported self-learning	3
Any Others	0
N.D.	3
Total	25

Why use eLearning?

The most common reason given was the possibility of providing access to learners who would find it difficult to attend conventional classes. One large-scale project aimed to give college teachers a formal teaching qualification at a distance. The project leader noted that:
To organize times when all unqualified teachers could attend a taught programme would throw college timetables into chaos.

In other projects (e.g. Case Study 2: FaDol), learners were thinly dispersed over a wide geographical area, making it impractical to organize classroom training. In another case, eLearning was used to reach audiences outside the country providing the training. Access was not the only motivation and in several cases eLearning was seen as a way of promoting teachers or trainers' ability to learn on their own (self-training) or of introducing new training methodologies or providing better attention to individual learners. Additionally, some interviewees believed the use of eLearning would improve familiarity with ICT. Interestingly not a single interviewee referred to eLearning as a way of reducing the cost of training.

Entry level skills to eLearning development

Where project teams were new to the development process, many found the task of selecting appropriate software development tools problematic. Some attempted to create their own tools, before abandoning the task and seeking out existing software or using a reliable development agency.

Another entry-level skill that proved difficult, was estimating the costs of start-up. Many projects found that the initial costs of an eLearning development programme were much higher than anticipated, partly because more mistakes were made at this stage. In general, many projects lacked a robust economic model and were unable to provide evidence of their economic viability – particularly when pump priming funds or grants were exhausted.

Technical strategies

The projects included in this research employed four main classes of technology.

- **Authoring tools**: to create and edit digital learning materials.
- **Learner Management tools**: to manage the learning process, dealing with user registration and profiles, monitoring learner usage of the system, providing learner information to tutors and managers.
- **Content management and delivery tools**: to organize learning materials into a coherent "catalogue" and to present this to learners with tools to deliver learning content to the learner, during the learning process. In some cases Content Management was handled by the same **Learning Management System** or **Virtual Learning Environment** used to provide learner management.
- **Communications tools**: to manage communications between and among learners and tutors.

Despite the plethora of Virtual and Managed Learning Environments available, few projects actually indicated they were using a proprietary platform. It is known that most commercially produced platforms have an underlying pedagogy or set of principles and these may be inappropriate for a context in which alternative approaches are central to the intended learning/training event. Interestingly, most projects used a range of tools drawn from those widely available on the desktop or via the Internet or in some cases had commissioned the production of bespoke tools.

Management of projects

Most case studies engaged in the following six management activities:

- Needs analysis;
- Instructional design;
- Development;
- Delivery;
- Evaluation;
- Co-ordination and project management.

Interviews with project leaders showed they all engaged with these activities but not always in the same order. More significantly, perhaps, it was observed that in many smaller projects the above activities proceeded in parallel for the duration of the project, with the experience gained from delivery and evaluation being used to continuously update the needs analysis and the instructional design.

Most projects were developed by teams rather than by small groups or individuals. Moving from individual or small groups to large-scale development can be problematic, however, as it takes time to develop understanding, positive group dynamics, and overcome bottlenecks.

The diversity of management approaches included:

- The use of 'flattened' management structures in which the stress is placed upon team decision-making.
- The use of a full-time community manager to oversee and assist interactions within a virtual

network of practitioners.
- Building and developing a knowledge management system with strong emphasis on using the ideas and suggestions of the community of users (bottom up project management).
- Establishing an Advisory Board that may contain some internal (e.g., course leaders) as well as external experts (e.g. eLearning consultants), to review quality and to identify enhancements.

More than one project leader stated that one of the main differences between e- and traditional learning is that eLearning projects are more complex. There are more things to be decided e.g. the mix between classroom and distance learning, teaching strategies, technologies and tutoring techniques. Many eLearning projects (particularly large-scale) involved the design and implementation of complex technological systems and/or digital learning materials; processes, unfamiliar to most training organizations, where budget overruns and missed deadlines were common.

Issues in eLearning design

Pedagogy

There were few definitive 'answers' to what instructional principles or processes should be adopted for eLearning design. Where no particular pedagogical stance had been adopted a common-sense approach using guiding principles to make the exchange of knowledge and information easier was evident.

In one case (Case Study 13: CeLTT), a number of alternative approaches had been developed to explicitly model good practice. The first course used a more instructivist or behaviourist approach that was mostly teacher-centred. Subsequent courses allowed for much less teacher control being more learner-focussed. One course was based on collaborative enquiry based learning and another on a personal learning contract. Where conscious pedagogic principles could be identified in other cases these included:

- Social-constructivism following the principles of Rich Environments for Active Learning – REALs.
- Collaborative learning, involving reflective thinking, social learning (from peers) and a 'reward pedagogy' with regular and timely feedback.
- Role-model behaviour (using video clips) to demonstrate positive and negative roles.
- Coaching (facilitating) similar to Vygotsky's theory of the zone of proximal development in which people learnt new skills by following the example of others.

It is perhaps significant that so many projects made use of blended learning rather than relying solely on the technology for delivery.

eTutoring

eTutoring is a relatively new learning and teaching process and most organisations were 'feeling their way'. They had to learn new approaches to teaching and supporting students. One approach to this was through experiential learning where virtual tutors were trained in exactly the same environment as their learners. Issues to emerge included:

- Managing the learner. The skills here are similar to those facing a classroom teacher, e.g. encouraging the quiet learner, managing the loud learner, dealing with people with poor etiquette, etc.
- Resource management, especially tutor time. For a global learner audience, eTutor rotas may have to be organised to ensure quick response and interaction times to learners across multiple time zones.
- Managing people who leave the programme.
- Creation of the portfolio of course participants and the problem of managing the virtual class in an absolutely new context.
- Maintaining students' motivation and getting them to respect agreed working times.
- Managing the online tutors, especially where they have been used to facilitating within an academic environment (often with teachers) and then have to move to facilitating human resource professionals and trainers.

Activities and competencies in eLearning development

The growth of innovative practices in eLearning has contributed to the development of new skills and competencies and novel ways of putting them to work – often within project teams. Traditional skills are essential to eLearning but are insufficient. Successfully designing and managing an eLearning project requires new skills to handle the complexity, properly exploit the potential of new technology and to manage the special problems arising from the lack of face-to-face contact with learners.

User needs analysis. Where projects made a systematic effort to investigate user needs they used a mix of techniques. These included paper and web-based questionnaires, interviews with teachers and learners, expert review, and direct observation. In organizations providing services to diversified populations what is required is the ability to design and use analysis tools and techniques (questionnaires, user interviews), or the ability to discuss user needs with managers in a customer organisation. In international projects it may be necessary to take account of linguistic and inter-cultural issues.

Instructional design. Several respondents expressed their dissatisfaction with the concept of 'instructional design' – which, in their opinion, reflected an outmoded view of the educational process. Project leaders used many different terms to refer to this phase in the project life cycle. Some talked in terms of 'educational design' or 'educational engineering' (ingegnerie pédagogique); others saw themselves as designers of 'training paths' or 'learning experiences'. There is wide recognition, that eLearning projects are complex and an effective eLearning development team requires the presence of multidisciplinary skills, across all and within individual members of the team.

Development. Content-driven projects (transmitted knowledge) tended to produce large volumes of high quality materials where layouts were professionally designed and the 'aesthetic' quality of graphics, audio and visual materials were very high. In many cases Web design and graphics work was outsourced where professional authoring tools were employed requiring heavy investments in time, money and human resources. Where organizations maintained their own technological infrastructure they needed specific technological competencies within the project team. The roles in these projects often included:

- Project Manager
- System Instructional Designer

- Product Instructional Designer
- Learning Administrator
- Tutors and Writers

In smaller, 'process-driven' projects the quality of tutor-learner interaction (negotiated knowledge) usually took priority over design issues. Some or all of the learning materials used in these projects were developed using simple personal productivity tools such as those available in Microsoft Office.

Large-scale projects invested more in the development of learning materials and also invested more in 'platforms': Virtual Learning Environments and Learning and Content Management Systems. The impact of these strategies on the development process was significant. In many projects it changed the balance in the team with engineers and web designers assuming more important roles than in smaller, 'process-driven' projects.

Delivery. In the 'blended learning' projects 'delivery' involved a mix of teacher-led activities in the classroom, teacher led or group activities at a distance and self-study (nearly always with tutorial support). These activities were supported by a range of technological tools used for the distribution of learning materials and to provide effective channels of communication among learners and between learners and tutors (or trainers). In most projects the main activity during the delivery phase consisted of tutoring and teaching but the use of technological tools implies additional activities and competencies to manage, maintain and support these tools. The success of the project was often dependent on the skills and quality of technical support provided to end-users.

Evaluation. Nearly all projects placed considerable emphasis on the collection of feedback from users. In the case of very large projects automatic tools were used to distribute and collect questionnaires. Smaller projects emphasized direct meetings between designers, learners and employers, using the feedback received during these meetings to modify their projects' learning strategies and technological options.

eLearning and innovation

Many of the projects demonstrated innovative practices in their scale, approaches to learning, adaptation of various technical platforms, and the blends of management and leadership strategies and skills. Innovation, of course, is relative and for some institutions, moving to a modest level of technological use from nothing is itself innovative.

Some projects reported a culture change with multimedia becoming accepted as a valuable and viable means of educational development, both by managers and end-users (teachers and trainers). There is evidence to suggest that acceptance of eLearning can result from a pioneering project that helps to change perceptions. Sometimes eLearning may help to change an organisational culture but whatever the context, eLearning is making a difference to the extent that it is being utilised in a multiplicity of organisational environments and for diverse audiences.

KEY RECOMMENDATIONS

Detailed recommendations and further discussion of the issues are contained in the full report, available through CEDEFOP's Electronic Training Village at: http://www2.trainingvillage.gr/etv/bookshop/list.asp. What follows is a summary of recommendations for a variety of stakeholders.

Practitioners

- Identify and build upon existing effective practices.
- Determine and formalise your own eLearning strategy and business plan, bearing in mind that there is no definitive approach to eLearning.
- Employ a stable and adequately supported environment in which to work.
- Adopt a participative approach amongst the project team and with end-users.
- Monitor and assess the system on a continuous basis throughout the development cycle.
- Determine a full range of performance indicators for every phase of development.
- Build a strong 'back office' sub-system, including levels of central technical support.
- Adapt tutoring (techniques, action modes, intervention levels, rhythms, etc.) to users' autonomy (motivation and meta-skills).
- Design and operate a 'user-oriented' technical architecture.

National Policy Makers

- Advise eLearning developers to clearly identify the add-on value of eLearning, if any, compared with traditional learning activities.
- Encourage eLearning developers to specify and design against coherent learning (pedagogic) models and to demonstrate how such models bring good educational practice to the instructional design process.
- Encourage eLearning developers to work with potential end users (teachers and trainers) in the instructional design process as well as formative and summative evaluation.
- Develop policies for improving the ICT skills of end-users so that they are more 'enabled' for using eLearning.
- Advise novice eLearning development teams to elicit the involvement of experienced eLearning project managers or programmers in the start up phases of a project.
- Encourage eLearning providers to use low tutor-learner ratios in order to establish quality in the tutor-learner relationship.
- Attach great importance in funding decisions to educational considerations; technologies (unless clearly inadequate) should be considered to be of secondary importance.
- Provide funding for the development of new eLearning skills in project management, design skills, tutoring skills, skills in technical support, etc. This will reduce the current "skill gap", leading to better projects, improved uptake by learners and a greater contribution of eLearning to the new information economy.

European Policy Makers

EU policy makers have an opportunity to influence the direction that eLearning for teachers and trainers will be taking over the coming years. It is recommended, therefore, that policy makers consider some of the following approaches:

- Advise governments, regional authorities and other stakeholders that eLearning developers make

out a clear business case for eLearning development prior to the funding of projects.

- Establish and promote a coherent set of European-wide e-tutoring competency standards, linked to accreditation and qualifications in order to promote professionalisation of eTutoring.
- Encourage diversity in European-funded projects, with a mix of different project goals, different target audiences and different organizational contexts - requiring the need for different learning strategies, technologies and skills.
- Continue to fund large eLearning projects with thousands or tens of thousands of users, recognizing that the strategies and technologies adopted by these projects will be very different from those used by smaller projects.
- Recognize the vital role played by small and very small projects, especially where the proposing organization can demonstrate deep knowledge of the needs of a specific target population.
- Recognize the importance of traditional training and training management skills in effective eLearning and acknowledge that in certain circumstances these skills may be inadequate. Funding should be provided to update the skills of eLearning personnel in this area.
- Take measures to encourage the sharing of best practice (e.g. 'networks of excellence', exchanges of staff, scholarships, study visits, conferences, seminars publications, etc. The TTnet study brought to light the diversity of current European eLearning projects. Yet at the same time the study showed that many project leaders were unaware of the full range of options open to them. Developers in one European country often have no knowledge of what is common practice elsewhere.

Finally, it is hoped that this TTnet study and the results that have emanated from it, will make a contribution to spreading awareness and knowledge of best practice in eLearning design and development with particular reference to the training of trainers.

SUMMARY

The study found that elearning is enjoying a growing maturity, blending the technology with other forms of delivery such as face-to-face teaching. While some projects studies were relatively small scale, others were regional or even national in scope. One innovative feature found by the study, then, was the growing scale of elearning programmes. Some of these have moved from being mere elearning courses, to coherent Learner Management Systems were content, resources and communications tools are made available within a single environment. On the vital subject of pedagogy it was encouraging to find that some of the projects have moved beyond behaviourist forms of design towards a constructivist or collaborative pedagogical approach.

What was clear from the research project, however, is that innovation can take many and diverse forms. Those organisations setting out on the road to elearning development for the first time are, in sense, embarking on innovation. For those more experienced organisations, innovation is delivered through the scale and technological complexity of materials, learner management systems and interactive tools. But in many cases, innovation goes beyond the elearning system itself. For elearning to be successful, organisations often have to transform their attitude to elearning and the way they adapt to it. Hence, the innovative element becomes not so much the technology, as cultural change within the organisation itself.

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