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# Editorial

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## Introduction

BT has had, and will continue to have, a long and fruitful partnership with all the education sectors in the UK. This includes supporting schools (e.g., the LINK scheme), the higher education (HE) sector (e.g., the University Development Awards) and more recently the further education (FE) sector also through an award scheme. These initiatives form part of BT's community programme. It was not until 1994 that BT considered entering the education and training market on a commercial footing. At about that time, the Education and Training Research Programme began at what was then BT Laboratories, now BT Adastral Park.

This special issue describes some of the work carried out as part of this programme, either directly or through close links with academic partners. The papers focus on our work in HE and FE. However, one paper (Bowskill and Dyer) refers to technology use in schools. The technology used and the lessons learnt from this work are transferable to other sectors. The selected papers deal with the following issues:

- learning theories (Fowler and Mayes) and their implications (Dineen, Mayes and Lee);
- the construction of a Generic Learning Platform (Gardner and Ward);
- management of change issues (Squires);
- demonstrations of the next generation of educational and training services (Bowskill and Dyer, and Squires).

We also support innovative work through our BT short-term research fellows. The paper by Squires illustrates such work.

## Learning theories and their implications

BT Adastral Park has many talented technologists and our universities have some first-class lecturers. However, there is a reality gap between the understanding of the pedagogy and the realization of appropriate learning technologies. We argue that you cannot have 'pedagogy

without technology' nor 'technology without pedagogy'. It was our attempt to bridge the gap between theory and design that drove the work into formulating a learning framework. Mayes (1995) started the processes through developing a three-stage model of learning. The model was soon refined on the basis of experience (Fowler and Mayes, 1997) but we still felt it was lacking in the areas of explaining motivation, adequately reflecting the social nature of learning, and recognizing the interplay between pedagogical and organizational design. It was these issues and others that Fowler and Mayes address in this issue through their concept of 'learning relationships'. Although this is essentially a theoretical paper, it is one that is grounded in design and practice issues. The approach offered focuses on reality, and we hope will inform both instructional and learning system design in the future.

One of the implications arising from the work of Fowler and Mayes is the need to rethink our concept of courseware in the digital world (Mayes and Fowler, 1999). Another is the recognition, or perhaps rediscovery, of the importance of dialogue in learning, and the reuse of dialogue for the vicarious learner (Mayes *et al.*, this edition). The vicarious learning or 'learning by lurking' once frowned upon in our tutorials may now have a legitimate place in the range of available learning styles or strategies.

### **Generic learning platforms (GLP)**

An important observation arising particularly from the work with schools was the ability of the children to learn quickly to use a full range of software. We did not develop special software, even for the youngest children with whom we worked (nine years old). They were exposed to and successfully used proprietary software (e.g., *MS Office; Adobe Photoshop*). This led us to think that at least between the ages of nine and ninety learning was a universal process, and building sector-specific solutions made little educational or commercial sense. From this the notion of the Generic Learning Platform (GLP) was born. The GLP described in the paper was heavily influenced by Mayes' framework. In particular the use of the 'Meeting Place' was in direct response to providing a rich area for dialogue to take place and be captured for reuse.

Of course, we recognized that the basic components were universal but each instantiation would need to be configured to suit the particular needs of a sector (i.e. schools, FE, and HE). Indeed the GLP is an essential concept for realizing the notion of life-long learning. Commercially the GLP made sound business sense because of its ability to reuse the same basic components across a range of markets. Gardner and Ward's paper describes the GLP and our attempts to test it across the education market sectors.

### **Management of change issues**

It soon became apparent from our research that many of our concerns were less to do with the technology and more to do with the people. Winning the hearts and minds of teachers will be the key to any successful changes. These management of change issues were emphasized in our work with colleges. For example, in the Merlin and Northern Colleges Network trials (described by Gardner and Ward) the teachers suffered from a 'competence gap'. These were experienced teachers but they had difficulties making the transition from using traditional courseware to material based on digital technology. The temptation always was to digitize existing materials, and it was only when interactive designers joined the trials teams that they recognized the full power of digitized courseware.

In this context Squires attempts to offer a solution for the new teachers in these new and often virtual learning environments. In particular, Squires addresses the issue of the virtual teacher –

one no longer fixed in time or place. What are the needs of such teachers? A key concept for Squires is teachers maintaining 'presence', not in a physical sense, but in terms of their professional, commercial and managerial selves. Understanding the problem is not sufficient and Squires takes the issue further by offering a range of design solutions that could meet the needs of a 'peripatetic electronic teacher' (PET) in a future HE scenario.

### **The next generation of educational technologies**

The education and training programme needs to feed into the commercial arms of BT. We see ourselves as providing new ideas and concepts to our marketing people, service definitions to our product managers, and new tools and technologies for our developers. To help position our work we describe our research outputs as belonging to different generations. First-generation products and services are already out there in the market-place. As a research team we restrict ourselves to providing consultancy and evaluation of the use of the first-generation services. Second generation refers to the innovative use of existing or very soon-to-be technologies. Our school work is a good example of this. The Internet and ISDN had arrived but how teachers could use these technologies to rethink teaching and learning is still not well understood.

By contrast third-generation work is more at the cutting edge, often exploring the use of new technologies or extensive bandwidth provision. When new technologies become more available we need to be ready to understand how to exploit them. Unfortunately, the term generation, although useful initially, can become more difficult when used across sectors. For example, the technology described by Bowskill and Dyer is undoubtedly third generation with respect to the school sector, but only second generation for many corporates and some universities. The GLP described by Gardner and Ward is definitely considered as a second-generation product in all sectors, as the technology is not prohibitively expensive and it involves innovative practice on the part of the users.

### **The future of BT's education and training research programme**

Where is the programme going in the future? In a commercial environment, funding is on a yearly basis and can stop as easily as it starts! However, our current plans are to use Mayes's framework to design from scratch an Advanced Learning Environment. We are also interested in considering some of the 'implications' of work by Mayes *et al.* by further investigating learning relationships, social semiotics with particular emphasis on the cognitive implications of the new media, and the role of 'engagement' in learning. And on the practical side, we are interested in building analytical tools that can help us define services based on the learning relationship approach, and to explore the use of component architecture in association with meta data concepts in the design of virtual universities.

We have in our possession some very powerful educational tools. The question is: are they to remain on the shelf labelled as another set of educational technology tools that failed to live up to its promise or are we to grasp the nettle and truly re-engineer the way we teach and learn? We hope these papers make a small but significant contribution to answering this question.

### **Note**

<sup>1</sup> Chris Fowler is the Manager of the BT's Education and Training Research Programme. He also has responsibilities for ensuring that the research programme is co-ordinated with the marketing, service management, development and community arms of BT. The papers in this edition only originate from the research part of BT.

## References

- Fowler, C. J. H. and Mayes, J. T. (1997), 'Applying telepresence to education', *BT Technology Journal*, 14, 188-95.
- Mayes, J. T. and Fowler, C. J. H. (1999), 'Learning technology and usability: a framework for understanding courseware', *Interacting with Computers*, 11, 485-97.
- Mayes, J. T. (1995), 'Learning technologies and Groundhog Day', in Strang, W., Simpson, V. B. and Slater, D., *Hypermedia at Work: Practice and Theory in Higher Education*, Canterbury: University of Kent Press.

The three additional papers in this issue reflect the issues raised in the papers originating from BT Adastral Park. The discussion by Littlejohn and Cameron of the Strathclyde Learning Technology Initiative echoes the discussion of generic learning platforms, management of change issues and the next generation of learning technologies. Dale, Sullivan and Irvine, and Grantham and Hunt provide discussions which relate to pragmatic design and development issues associated with the new learning technologies.

*David Squires*