



How Extendable Is The Role Of Technology In  
Training?:  
A Grounded Theory Approach Into The British  
Companies

*Stream 25: A Critical Turn in HRD*

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## **ABSTRACT**

This research paper aims to understand the trajectories of development and distribution of new training technologies in large corporations. The main empirical data collection method is in-depth interviews conducted within the employees mainly working on training and development departments of two British companies. The methodological preference of the study is mainly a qualitative approach (Silverman, 1993).

The dominant training approach within the case study organisations is the employment of open learning centres that commonly use advanced technology and collect administrative data on the usage patterns of the users. The reactions to the usage of such centres and hence the adaptation of such a training strategy are varying from the high usage rates to the complete rejection of the current training technologies. This reasons for such a variety in responses (reactions) to the new technology is the primary concern of this study. Totally 25 employees, mostly working in the training and development function and the users of open learning centres, were interviewed in the two case study organisations. The semi-structured interviews were then analysed to see the main trends within the talks of the employees (Wolcott, 1994).

### **The role of technology in training**

Today an increasing number of people are interacting with technology; at the same time more and more people are being replaced by the introduction of technology-based and automated systems. With the rapid technological development, traditional methods are increasingly unable to meet the demand thus created. These rapid developments in technology are in some ways responsible for the increased requirement for training programmes. Most companies provide information about new training technologies in several ways. First, the information is available from several sources. Vendors continuously circulate the information on the systems they offer, ranging from ready-made programmes to consultants who can advise companies on their training needs. Inevitably, with information technology (IT), there is a need to be concerned with the development of the technology itself so that it can keep up to date with the facilities it has to offer.

The new wave of training is based on 'new training technologies' and this is related to two sides of the development path. On the software side, the term covers an important range of authoring tools offering trainer-authors the chance to ensure that the software can handle the company's specific training problems. The term also covers the hardware that trainers can use, the mainframe computers and telecommunication systems and even satellites. Trainers see the introduction of new computer technologies as vital to their businesses, as they hope the technology will make training more efficient.

The sophistication and availability of current TBL systems enables training to be provided in areas previously thought unsuited to TBL methods. The new understanding of technology and its applications to training make the new training methods attractive to companies. Training through the new technology is different from conventional training through lectures, television or printed manuals. Education and training technologies will follow the vision of education and training in the 21st century and this vision should take into account the potential of technology, but the vision should be driven by the needs of individuals as well as technological development.

## **A brief history of training technologies**

In a period of rapid technological change, there have been many training technologies. These technologies vary from basic training activities such as lectures, talks, discussions, role-play and case-studies to more complex techniques including Technology-based learning (TBL), computer-based training, interactive video, multimedia supported training technologies, the Internet, intranet (corporate-wide Internet systems), virtual reality and so on. The need for more information is becoming more crucial as organisations want to be sure of TBL's effectiveness before they decide whether they should use it or not.

The 1960s were the era of educational television, overheads and slides, along with the new technology of 'teaching machines'. The 1970s brought video cassettes and computer-assisted instruction. The 1980s saw interactive video (IV), artificial intelligence systems and Compact Disc technologies. The 1990s is witnessing a rapid transformation and innovation of advanced training technologies, including multimedia, CD-ROM and Hypermedia training technologies. In this new millennium, now we are talking about virtual reality, DVD, Internet-based solutions and who knows what the future will bring?

The training revolution began in the 1960s when companies looked for alternative techniques to meet individual training requirements. Implementing any kind of new technology, whether TBL or other innovations, is an extremely difficult venture. Innovation means the introduction of new traditions, roles and relationships. It means changing the way things have been done, perhaps for a long time. So, it is normal to face some kind of resistance within the organisation. TBL is a term encompassing most of the training technologies and it is considered as one of the turning points of the training technologies challenge. However, this advantageous role of TBL has been surpassed by the Internet and virtual reality-based training programmes, and both skills and knowledge are meant to be improved throughout training and education activities. However, again any new technological development in training methods should not necessarily replace previous methods, but, rather, can complement them.

Another step in training technologies is 'interactive multimedia' (Marx, 1995):

"Interactive multimedia generally refers to computer-based learning that includes sound, video, graphics, animation and text. Typically the training is delivered on CD-ROM because of its huge storage capacity" (p.58).

The potential of CD-ROM for the training industry is claimed that CD-ROMs will inevitably catch on in the training field because of its capabilities as a low-cost, high-density storage medium. Today DVDs seem to generate great opportunities for TBL platforms.

Finally, virtual reality (VR) is particularly used to simulate conditions that do not actually exist, but may also be used to simulate actual potential conditions. VR represents the ultimate training technology of today's organisations. Wagner and Campbell (1994) defines VR in a training sense:

"In an training sense, virtual reality is designed to simulate the work setting during the training process. ... Specifically, virtual reality is trying to recreate as nearly as possible participants' own working environment in a development setting" (p.8).

## **TBL in large organisations: The British Scene**

Some large companies and institutions, such as Prudential and Price Waterhouse began to experiment more boldly with TBL in open, distance and flexible Learning during the

1980s (Pinnington, 1990a) but we do not have much knowledge about how TBL is distributed and developed in practice. We know from evaluation research on specific TBL platforms, for example, interactive video (Pinnington, 1990b) and hypertext multimedia (Houldsworth, 1995) that automated learning programmes will be interpreted according to different individual perspectives which theoretically will be strongly influenced by ideology (Barley, 1986) and the dynamics of power in organisations (Stamper, 1987).

However, it is interesting to note that Reynolds and Ivinski (1996: 585), in another definition of TBL, take TBL to be the equivalent of computer-based learning (CBL). On another occasion they propose the term TBL stands for all of the computer-based systems, such as CBE, CBI and CBL. In their work they present their favourite definition of TBL offered by Donald Bitzer of the University of Illinois, father of computer-based education (CBE), in his own words as “any time a person and a computer come together and one of them learns something”.

A survey carried out by Harbridge House, based on a sample of 80 drawn from the 150 largest UK business organisations, revealed a great diversity of approaches to management training (Ascher, 1983):

“Harbridge House found that differences in training practices among large UK firms are substantial. ... We found that a management training programme often reflects the types of business the company is engaged in, as well as the size of its management force” (p.60).

The report concluded that the training manager plays an important role in determining the success of a training programme. The survey’s greatest disappointment was the widespread lack of serious programme evaluation.

This conclusion was confirmed once more, by another Harbridge House survey of medium-sized UK organisations (Mason, 1993:12). Also, Houldsworth and Hawkridge (1996) found that: “So far as we could tell, evaluation results seemed to have little or no impact on company training strategy or practice” (p.59).

The value of linking training to corporate strategy has been stressed by Hussey (1990) and Hendry (1991). Hussey (1985) argues that any corporate strategy must be looked at in the context of a number of factors or variables that affect the way in which the organisation works. However, Hendry (1991) sees that the stress on training as a response to immediate competitive pressures experienced by individual companies may not benefit individuals or the company in the long term. The problem is that firms tend not to perceive initial training as immediately important to their strategies. As a result, he concludes that remedies to solve the problem of initial training largely lie outside the framework of company strategic behaviour (p. 108). Finally, Keep (1989) noted that the large companies in his study were seen to be integrating training and development into their wider business planning and strategy implementation.

### **The Future of the Training Technologies**

There is a particular interest paid to hypermedia technologies as well as technology-based learning in the work by Houldsworth (1995). The aim of her study is to report on interviews in a small sample of large UK companies (Sainsbury’s, Ford Motor Co., Lloyds Bank Plc., Price Waterhouse), thus providing an update of the situation five years on. The interviews concentrated upon a range of issues with regards to TBL: delivery platform, target audience, training needs analysis, policy issues and strategy,

management and promotion of TBL and so on. As a result of this study, Houldsworth identifies some future prospects:

- “There is likely to be a move away from large scale expensive bespoke multimedia systems of a generic nature.
- Smaller scale lower-tech and cheaper programmes, which can be produced in house is likely to be used increasingly.
- Firms are likely to purchase generic off-the-shelf CD-ROM titles in areas of general business and behavioural skills, as these offer a more cost-effective training solution than in-house production of multimedia.
- Interactive video- the demise of which has been long-predicted, appears to be a ‘lively corpse’ and its use looks set to continue for the next 3-5 years whilst the debate over a CD platform continues.
- IV and CD based training will be delivered via special ‘centres’, in the majority of cases entitled ‘Open Learning Centres’.
- Longer term and perhaps not until technological advances allow for the PC to deliver multimedia, there is the suggestion that there will be a move towards ‘desk-top’ solutions, in the form of information resources” (p.139).

Another study by Houldsworth and Hawkrige (1996) is one of the latest attempts to analyse the distribution and development of TBL in large UK companies. Earlier work by Hawkrige, Newton and Hall (1988) provided an in-depth study into the use of technology in company training and showed that British companies gained a commanding lead within Europe due to installing ready-made US systems and also vigorous government support which subsidised UK developments of TBL. In a 1996 extension and update of this study, the Houldsworth and Hawkrige (1996) summarised the history of TBL developments in five large companies and also observed that during the 1980s, there was widespread interest in TBL among British companies such as British Telecom, Lloyds Bank and Sainsbury’s as a means of meeting their targets for greater efficiency, a reduction in the number of employers and cost savings. They found the future of TBL appeared assured in the companies interviewed. Specific to the internal labour market, they drew attention to an increased emphasis by the five case study companies on TBL for training junior, supervisory and middle managers. However, as Pinnington and Bayraktaroglu (1996) pointed out, there have always been strong audiences for TBL company training, and Houldsworth and Hawkrige (1996) did not provide any quantitative data as evidence for the extent of the change.

Guest and Vermeersch (1997) draw attention to the growing attention on multimedia training. The multimedia industry is growing quickly as a result of technological innovation, developments in the psychology of learning, a favourable corporate context and increasing training requirements: “Interest in multimedia training is mainly coming from the largest companies with the most significant training budgets” (p.5).

As a result, the application of technology-based learning techniques will be used increasingly and extensively. Thirty-two per cent of Fortune 500 companies are currently using TBL and this percentage is expected to double by 2002 (Datamonitor, 1999).

### **Claims of the Benefits of TBL**

Personnel managers, course developers and organisations generally are becoming more familiar with TBL. There have been various criticisms made about its advantages over traditional training techniques, such as the concern being expressed about the effectiveness of TBL in transferring skills to the trainee’s workplace and in improving the trainee’s performance (McKeown, 1991).

According to Labinger and Finch (1986), there are some advantages of TBL over traditional training techniques for organisations, administrators, trainers and trainees. The advantages for organisations include reduced travel costs, reduced overhead expenses and standardisation. The benefits of TBL for trainers include reduced travel time, usability where other media are difficult to use, up-to-date performance records and security of course content. Lastly, the advantages of TBL for trainees include reduced training time, training availability when needed, opportunity for active participation and immediate feedback. Reynolds and Ivinsky (1996: pp. 40-41) offer a more comprehensive list of the advantages of TBL covering almost the same points in more detail.

### **Cost Factors**

There are four methods ordinarily used to analyse the cost benefits of TBL: benefits, life cycle, productivity and resource requirements (Reynolds and Ivinsky, 1996: 103). Quantifying benefits is a difficult task, because the outcomes of training are often intangible or difficult to translate into monetary terms. Life cycle is helpful in assessing the cost function of the TBL project and its strong point is that trainers can evaluate the total costs of each of the planned programme's phases to determine whether it will result in net cost savings. A TBL programme's productivity can be calculated by comparing its efficiency and effectiveness towards trainees. This method can be used to demonstrate that a proposed project reduces training costs or utilises resources that produce increased training results. Lastly, the resource requirements method is the simplest and most direct way to compare the costs of two or more different training methods at any given time.

Most organisations initially use TBL to reduce training costs. TBL is often seen as a cost-effective alternative to running traditional training courses in different locations. However, as Guest and Vermeersch (1997) point out

"The bespoke production of multimedia training can incur a fairly high initial investment which usually has the effect of limiting customised production to larger companies with more significant training needs. ... Cost reduction is a strong incentive but rarely presents clear indications as to when and how best to conceive and use multimedia training applications" (p.92).

Lastly, Hunt and Clarke (1997) point out that the cost savings of TBL that have been reported in the literature mostly do not provide sufficient detail for specific direct comparisons to be made.

### **Time Savings**

Unlike traditional training methods, which generally cannot respond to feedback from trainees, flexible TBL programmes can be adjusted constantly in response to the demands of both the trainees and the trainers. With the capability of storing large amount of information, displaying it in different formats and processing this information through the programme very quickly, computers, and TBL in particular, offer a better chance for trainees to be trained more effectively.

### **Productivity Benefits**

Evidence is already available to prove that training, and TBL in particular, can stand alone as an effective management tool. The case for TBL is strengthening, as companies are forced to recognise the value of a highly trained and skilled workforce in today's fiercely competitive marketplace. The benefits of TBL should be analysed together, as one benefit might be the result or cause of another one. So, the cost savings and efficient use of time within TBL mean that it is a productive approach as

well. As all the factors analysed are better than those of the traditional techniques, this shows that TBL is the most preferable way of training. As the productivity of trainees is closely related to motivational issues, TBL, as an interactive system, provides a level of responsive feedback and an individual environment that has proven to be highly motivating to both individuals and groups. Therefore, advanced training technology professionals focus on providing a conducive environment for the learners during training sessions.

### **Disadvantages of TBL**

No training system has a perfect solution to the training requirements and may have some risks or possibilities. TBL has the following possible disadvantages;

- Off-the-shelf software/courseware may not be available, depending on the topic.
- Generic off-the-shelf software/courseware may not meet local needs.
- Initial cost of technology-based learning development is high, compared to the cost of designing and developing a lecture-based course.
- Development requires skills that may not be available.
- Development of high quality instruction requires intense and extensive effort.
- May require investing in new equipment.
- Equipping equal numbers of simultaneous learners costs more for technology-based learning (Reynolds and Ivinsky, 1996: 41).

The arguments made in favour of TBL as a training technique shows that TBL is a relatively successful training method considering the benefits stated above. However, there are other factors which are equally important before considering TBL solutions. The role of the private sector in TBL is growing. In the future a greater involvement on the part of the companies in terms of investment and participation should be encouraged, by a greater emphasis on the benefits of TBL. The acceptance and successful implementation of TBL has much to do with the attitude of the organisation within which it is to be used.

The factors influencing the development and distribution of TBL are very much related to a company's external environment, which includes other organisations, government and legislation, current competition conditions, the economy and social frameworks, in other words everything outside of the organisation. As Van Den Brande (1993) concluded,

“In large organisations and elsewhere TBL is still seen as complementary to traditional education and training. A development from traditional training towards advanced technology-based learning is visible, depending on the level of techno-economic development at company, regional and national levels”. (p.70)

### **THE EUROPEAN PATTERNS AND TRENDS WITHIN TBL**

Organisations intending to use TBL are faced with the choice of developing the materials themselves or purchasing existing packages. For generic training programmes, developing company-specific course material may be too expensive and time-consuming: it is more sensible to identify common training needs and then meet these needs with well-researched and well-designed packages so that the development costs are spread over a number of users. With the bespoke packages, producing some in-house materials is advisable as it would be cost-effective and efficient to solve the training demands from internal resources.

In the light of this preliminary information, Van Den Brande (1993), identified certain trends within TBL in Europe, and some components relevant to the framework of this study are:

- The majority of users of technology-based training are large companies delivering in-company training to their employees as a response to increased demand for better qualified people. This market is becoming more professionalised.
- The use of technology-based training by enterprises is linked to the level of technological integration and implementation at company, regional and national levels. An open attitude towards technology and its applications stimulates the use and production of technology-based learning.
- Technology-based learning is still seen as complementary to traditional education and training. A development from traditional training towards advanced technology-based learning is visible, depending on the level of techno-economic development at company, regional and national levels” (pp. 69-70).

More recently, Guest and Vermeersch (1997) predicted that the use of new distance learning technologies is set to revolutionise most companies’ training approaches and will ultimately transform their entire cultures. According to their report, the results foreseen from such developments in training technologies are:

- Cost reduction
- Continuous learning at the desktop and at home
- Electronic communities
- Leading-edge applications
- Training life cycles (pp. 142-43).

They stated in their report, ‘the Future of Multimedia Training’ (1997), that:

“The last four years have seen the rapid development of multimedia training on CD-ROM. It is anticipated that the next four will see a rapid growth in new distance learning solutions. As companies continue investing in networking and/or Internet solutions, and individuals further invest in PCs and Internet access for the home, the use of multimedia training both at the desktop and at home will increase” (p.133).

Finally they conclude that:

“Over the next two years, video-based solutions will increasingly become the norm - true multimedia will be of prime interest for most corporate applications. As high quality images, video and audio become readily available on networks (particularly intranets) and DVD\*, companies will push for its use. ... A true revolution is occurring, driven by end users’ demands. This will force companies to integrate new broadcasting and graphics skills and will require a radical shift in mind set” (p.134).

*Digital versatile discs- a storage device with a greater storage capacity than CD-ROM. DVDs should eventually replace CD-ROM in the next five years (ibid., p.156).*

## **METHOD**

The research involved data collection through face-to-face interview of the employees of two British companies. They were selected randomly at the various open learning centres where an extensive usage of the new training technologies are being offered to the employees and the managers. Each of the employees were asked to reflect their attitudes and responses to the current training technologies. The participants were interviewed by the same researcher



and the content of the interview questions consistently covered the following areas: their background and work experience; the role and structure of technology-based learning; their knowledge of the use of multimedia programmes; decision-making processes in training; and external and internal factors influencing the design and implementation of training.

All interviews were tape-recorded, and transcribed verbatim using normal punctuation. The transcriptions of the interviews were then used for the frequency analysis to see the significant themes within the research framework. The transcripts were analysed for their individual themes and actions and through this process, it was possible to define normative themes and actions and individual isolates from the norm. The normative responses were assumed to be evidence of the responses of the interviewed group.

The analysis of the transcripts produced some themes and actions which seemed to the researcher to be the primary concern of the individuals interviewed. The most frequently mentioned points were taken as representing the employees' perceptions on the usage of technology for training purposes.

The most frequently emphasised themes on the assessment of the open learning centres were as follows: The respondents were in a position to be seeking more understanding and guidance from their managers. The most of the interviewees believed in the practicality of the current training technologies although some different points were emphasised. They had the impression that the management team did rarely use the centres and this is due to their lack of the vision for the future. Both companies were exploiting the up-to-date training technology with a difference that although British Telecom is a pioneer, Rover Group is a typical lagger. The attendants expressed the potential of the future of training in the open learning centres as it is a flexible learning environment. However, there is a conflict or dilemma of releasing employees from productive tasks and problems of low attendance in the open learning centres. The managers seemed to believe in the promotion of the development and encouragement of more motivated people and self-directed learning. Openness to using a wide range of training institutions including open learning centres and innovative delivery methods was apparent within the training structure of the companies. Inevitably, given the difficult context for training and development much of the problems mentioned by the employees consisted of isolated activities and dealing with difficulties of access.

## **CONCLUSION**

The majority of the interviewees' talk was concerned with the efficient administration of such techniques. Self-development in Rover Group is constrained by managers' agendas for remote control. There is evidence for managers' deliberately adapting a style of management and creating a flexible system to channel employees' development in line with the company's business strategy. The managers were generally seen to be supportive of the role of TBL as a technology likely to train and develop consistent with the business strategy. There also was the beginning of a long-term training perception supportive of virtual reality and automated learning as means of changing and developing employees.

The institution of open learning was well assessed by managers as a critical, formal means of dealing with the difficulty that employees encounter in British Telecom during normal working hours. Most of the efforts made by the management team showed general concern to simulate and capture the discretionary effort of employees. Rover Group's emphasise is not the extensive usage of the training technologies as it is not at the leading edge of implementing training technologies. Its lack of co-ordination and creativity in administration of training and development is reflected in its unsophisticated management systems and under-use of the open learning centres.

We conclude that employee development in Rover Group is constrained by *low visibility training* which comprises devolved delivery, central initiative inadequately integrated by business managers, automated learning using British Telecom and the managers seemed to be supporting the status quo. On the other hand, in spite of strongly and clearly defined mission statement of exploiting technology wherever possible, the strategic planning and the reasoning of British Telecom managers interviewed to what extent advanced training technologies should be employed still remained vague.

Our research findings suggest that, the open learning centres constitute suitable learning environments despite the fact that there must be a clear understanding of the usage purposes of the centres. The centres were seen as a means of the resolution of the dilemma of not having the intention of releasing the workforce from the production area as well as holding the vision for increasing the skill levels of the employees. So both the companies come to a point whereby they have to make their decisions whether to support their employees to develop themselves or to hold short term view of maximising the product quantities. The idea of open learning is reflected differently in two companies: Whilst the distribution of automated learning in Rover Group is mostly situated in learning centres located on the different sites, British Telecom's preference of more widely distribution of learning environments and hence being available in most parts of the employee workplace.

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