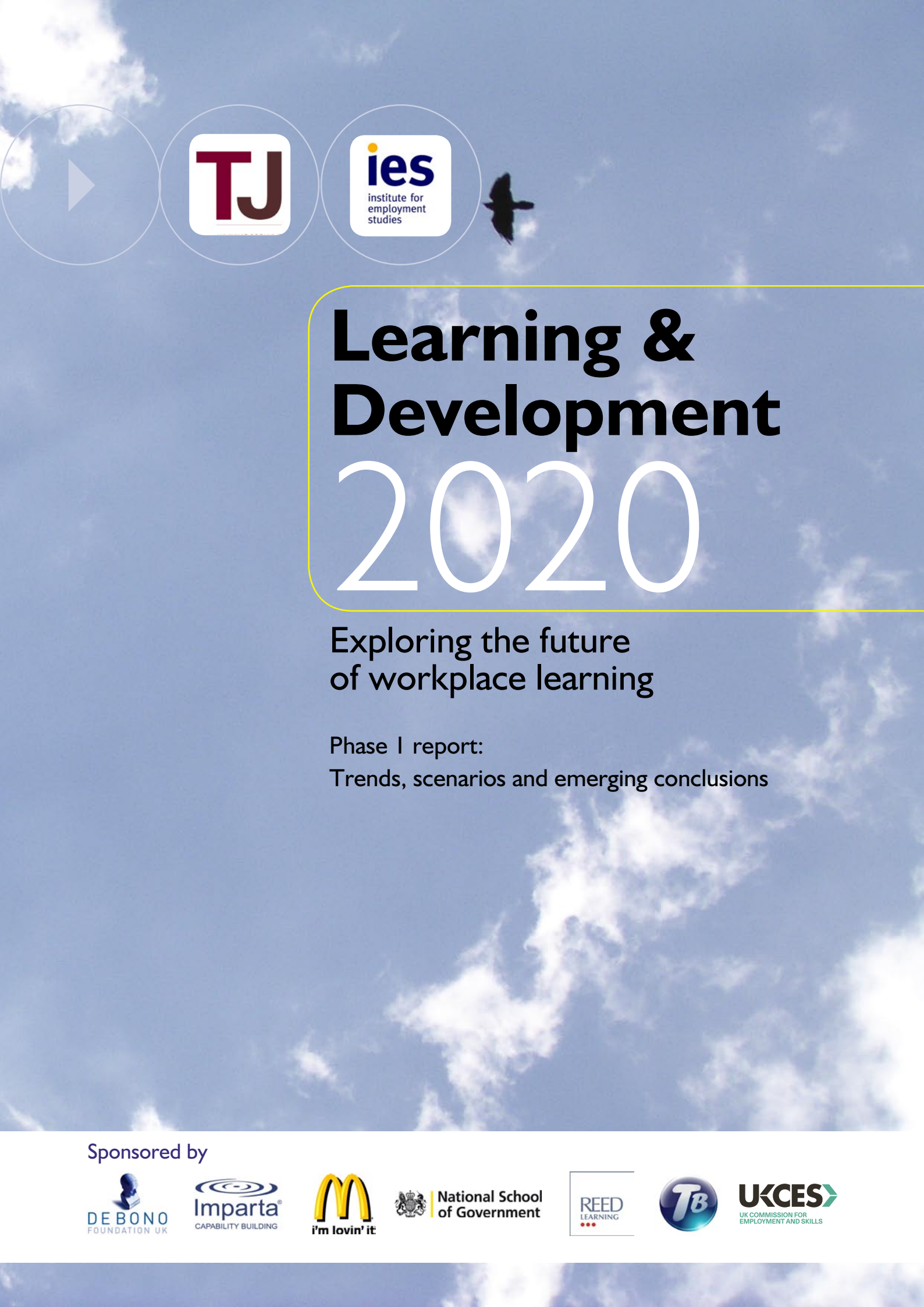

Learning & Development 2020

Exploring the future of workplace learning

Phase 1 report:
Trends, scenarios and emerging conclusions

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TJ, formerly *Training Journal*, has been the publication for learning and development professionals for over 40 years.

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The Institute for Employment Studies is an independent, apolitical, international centre of research and consultancy in public employment policy and organisational human resource issues.

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September 2008

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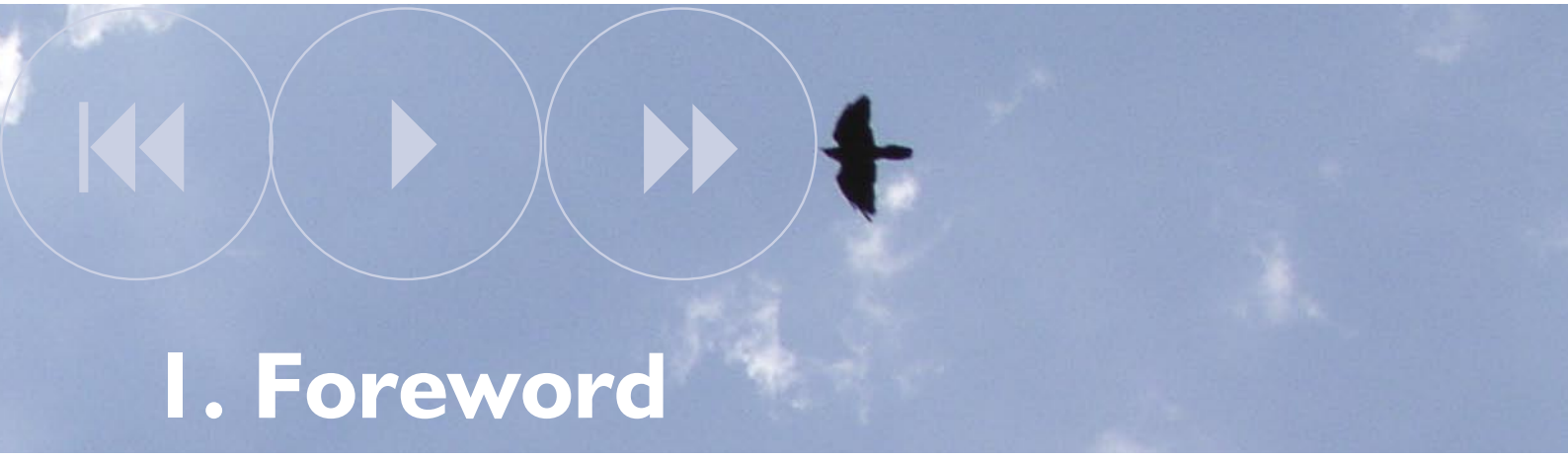


1. Foreword

Wanting to know what lies ahead is a common human desire as evidenced by the continuing popularity of astrology and horoscopes; knowing something about the future gives us control and for many of us it is a really important part of our life planning. But trying to predict the future is notoriously unreliable as the following quote from Albert Einstein clearly illustrates: "There is not the slightest indication that nuclear energy will ever be obtainable".

While clearly predicting the future isn't possible I believe that exploring and discussing ideas about what the future holds is important for any profession eager to take proactive steps to ensure progress. Without visionaries willing to look ahead scientific and technological developments would clearly be very slow.

I was therefore delighted when the Institute of Employment Studies agreed to join with TJ to undertaken a research project to look at the future of workplace learning and what may lie ahead for L&D specialists in say five to ten years time.

L&D 2020 was launched in the early part of 2008 and my thanks go to our sponsors who have generously supported this project: the De Bono Foundation UK; Imparta; McDonald's Restaurants Ltd; National School of Government; Reed Learning; TrainerBase and the UK Commission for Employment and Skills. Our eight months of desk research and workshops have generated ideas and debate about how workplace learning may change over the coming years and how this will impact on organisations, L&D professionals and individuals. While clearly the investigation will continue next year there are some fascinating ideas emerging at the end of this first stage.

Learning is moving towards a more continuous and social process, where informality replaces the more structured interventions of the past. The need for organisations to adapt and change quickly as the world develops at an ever increasing pace demands different solutions and organisations are likely to encourage their people to take greater responsibility for their own learning. This informality is likely to be supported by technology, with the role of the line manager becoming increasingly more central to the success of learning initiatives.

The move to a more informal process of learning inevitably will lead to a demand for new ways in which learning can be valued and organisations and awarding bodies will be looking for new ways to accredit learning to ensure its portability for individuals moving from job to job. This informal approach will also require new approaches to the ever thorny issue of evaluation and it is quite possible that many of these informal initiatives will not be able to be formally measured at all.

All the emerging conclusions have important implications for L&D professionals and quite clearly there are going to be real potential for those willing to grasp the opportunities as they arise. The future for those involved in workplace learning is challenging and exciting and continuing to explore future possibilities is never more important than it is now.

Debbie Carter

Editor, TJ

2. Executive summary

Overview

The aim of the project is to explore how Learning & Development in organisations might develop over the next five to ten years, particularly focusing on the implications for L&D professionals. We deliberately describe it as an exploration as the future is impossible to predict with any degree of certainty. It is through a process of dialogue about the possibilities that individuals and organisations will develop their own thoughts about how they want to respond to the emerging trends or, indeed, how they want to help some of the possibilities become reality.

The Project

This first phase of the project has had three main elements. First, we identified trends and developments that might impact the world of Learning & Development. We have described these trends under 36 headings grouped into the four areas of Society, Work & Business, Brain & Mind and Technology. We then developed the second main element of the project, the scenarios. These are three possible futures that might emerge for Learning & Development and are designed to stimulate discussion about how L&D might respond in the different situations:

- L&D is queen – impact of learning is clear and learning & well-being are highly important for organisations, learning is for whole life not just work
- Organisational necessity – economy and competition are tough, learning is focused on just immediate work issues and is seen as a cost to be contained
- National learning – UK Plc is struggling and the government is driving the learning and well-being agenda, companies are reluctant to invest in training

Out of a short series of workshops and dialogue with other colleagues came a number of emerging conclusions, the third element of this first phase of the project.

Emerging conclusions

L&D is changing and will continue to change. The scenarios describe some very different possible futures and yet some key themes emerged which reflect the changes as being evolutionary rather than revolutionary, continuing travel along the path that some organisations have already started.

- The importance of continuous, informal, social learning will continue to grow and will require L&D professionals to become competent in creating the conditions for this to occur.
- Individuals will increasingly look for ways for their informal learning to be recognised (accredited) to demonstrate their value in the market.
- The skill of learning will become increasingly important and people will need to be helped to become even more effective at learning for themselves and with others.
- Whilst individuals will find ways to learn for themselves, the role of the line manager in focusing and reinforcing learning will continue to be crucial.
- New technologies are not just ways of delivering the same content differently, they open up new opportunities for people to learn.
- The boundaries between L&D and OD will blur further as learning is embedded into the way organisations work.
- There will be a shift in balance of the L&D professionals' skillset towards greater business understanding, change management, organisation development and use of new technologies.

Next steps

This first phase of the project has focused on developing possible scenarios and developing some initial conclusions. The second phase is planned to share these ideas more widely to create a dialogue with leading practitioners in the L&D field.

3. The project

3.1 Overview

The aim of the project is to explore how Learning & Development in organisations might develop over the next five to ten years, particularly focusing on the implications for L&D professionals. We deliberately describe it as an exploration as the future is impossible to predict with any degree of certainty. It is through a process of dialogue about the possibilities that individuals and organisations will develop their own thoughts about how they want to respond to the emerging trends or, indeed, how they want to help some of the possibilities become reality.

This report presents the findings of the first phase of the project including some emerging conclusions.

3.2 Process

This first phase of the project has three main elements. First, we identified trends and developments that might impact the world of learning and development. We have described these trends under 36 headings grouped into the four areas of Society, Work & Business, Brain & Mind and Technology.

These trends formed the basis of a first workshop with the sponsor organisations at which the trends were discussed, new ideas added by the participants and those that were most important for L&D identified. Following this workshop, we then developed the second main element of the project, the scenarios. These are three possible futures that might emerge for Learning & Development and are designed to stimulate discussion about how L&D might respond in the different situations.

The scenarios were then used as the basis for two further workshops (one with sponsors and a further one with other L&D practitioners) where participants discussed the implications of each scenario for organisations, individual learners and L&D professionals. Out of these workshops and dialogue with other colleagues came a number of emerging conclusions, the third element of this phase of the project.

3.3 Next steps

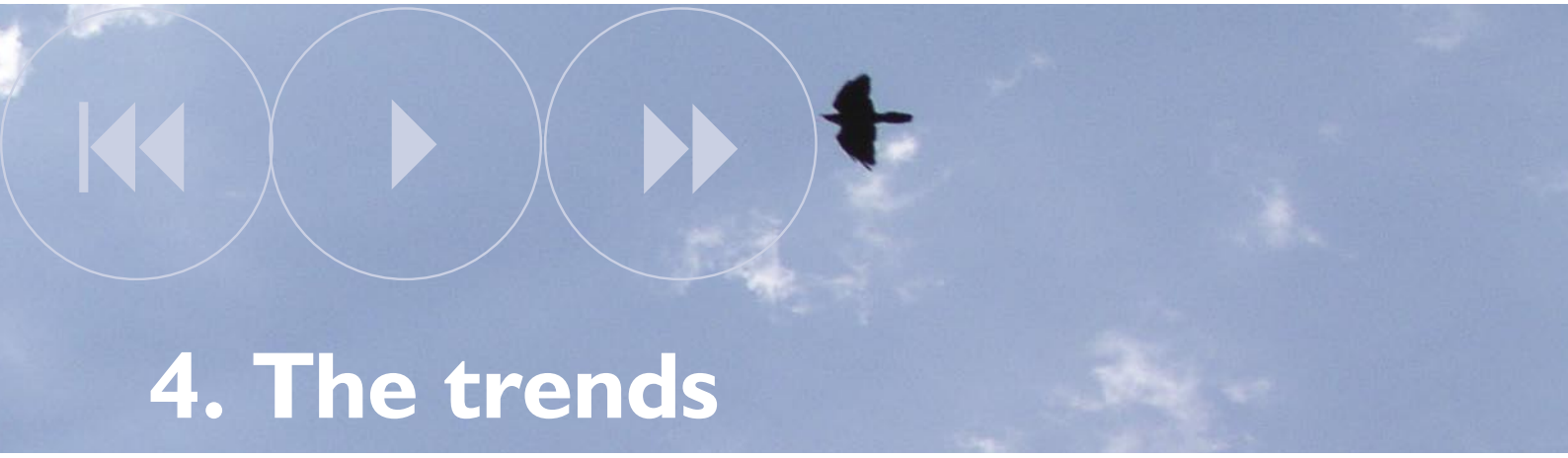
3.3.1 The project

The nature of future-oriented, exploratory work of this kind is such that the more people are involved in the discussion the wider the range of ideas are incorporated and, at the same time, the more robust the conclusions can become. Consequently, the next stage of the project is intended to create a wider range of conversations with L&D practitioners to test out the ideas so far and add to the richness of the content created.

3.3.2 Practitioners

Whilst initial conclusions are just beginning to emerge from the project, we believe that there is already a wealth of material in the trends and scenarios that L&D practitioners can use to stimulate discussion in their own organisations about how they want Learning & Development to evolve and grow.

It also provides the opportunity for individuals to think about their own skillset and future career path, as well as for external providers to consider how they want to respond to the emerging challenges and opportunities.



4. The trends

4.1 Overview

The first element of this phase of the project consisted of IES drawing from a range of sources to identify 36 broad trends or developments that might change the future work and learning landscape. These were grouped in the areas of Society, Work & Business, Brain & Mind and Technology; some are natural extensions of some of the trends already affecting L&D, whilst others aim to look a little further out.

Since anyone who tries to predict the future is almost always wrong, these trends and themes were designed to be provocative and stimulating rather than predictions of what will actually happen. It is easy to forget that if we look back just twelve years, most of us didn't have ready access to the internet or the powerful mobile devices that we now rely on. At the same time, the rapid development of home working and portfolio careers has yet to emerge at the rate predicted at that time

The table (see page 9) describes the individual trends that were considered and Appendix 1 has a one-page description of each of them together with links to further information.

4.2 Importance & uncertainty

At the first workshop with the sponsors the 36 trends were presented and discussed. Participants added in their own ideas about factors that might be important and the complete set of ideas and trends were synthesised down to those that were thought to be relevant to the world of L&D. Through a series of discussions and a Post-it Note® exercise, the key factors were then mapped onto an importance-uncertainty grid. The importance axis was designed to reflect the magnitude of the potential impact that a particular factor might have on Learning & Development, whilst the uncertainty axis described the degree of certainty that there was about the factor and its impact.

The map that was created is shown in Figure 1 (see page 10). It is worth recognising that this mapping reflects the views of the participants at that first workshop and that other groups might have created a slightly different set of factors and map.

Table of trends

Society

S1. Changing demographics

S2. Globalisation

S3. Generational values

S4. Technological lifestyle

S5. Knowledge society

S6. Environmental concerns

S7. Education trends

S8. Consumer society

S9. Global poverty

Work & Business

W1. Big business

W2. Small businesses

W3. Flexible working

W4. Moofers (Mobile out of office workers)

W5. Leadership and management

W6. Worker expectations

W7. Types of jobs

Brain & Mind

B1. Informal learning

B2. Implants

B3. Positive psychology

B4. Brain download

B5. Unconscious learning

B6. Smart drugs

B7. Accelerating learning

B8. Memory retention

B9. Cognitive fitness

B10. Adaptive learning

Technology

T1. Web trends

T2. E-learning trends

T3. Virtual worlds

T4. Telepresence

T5. M-learning

T6. Social networks and collaboration

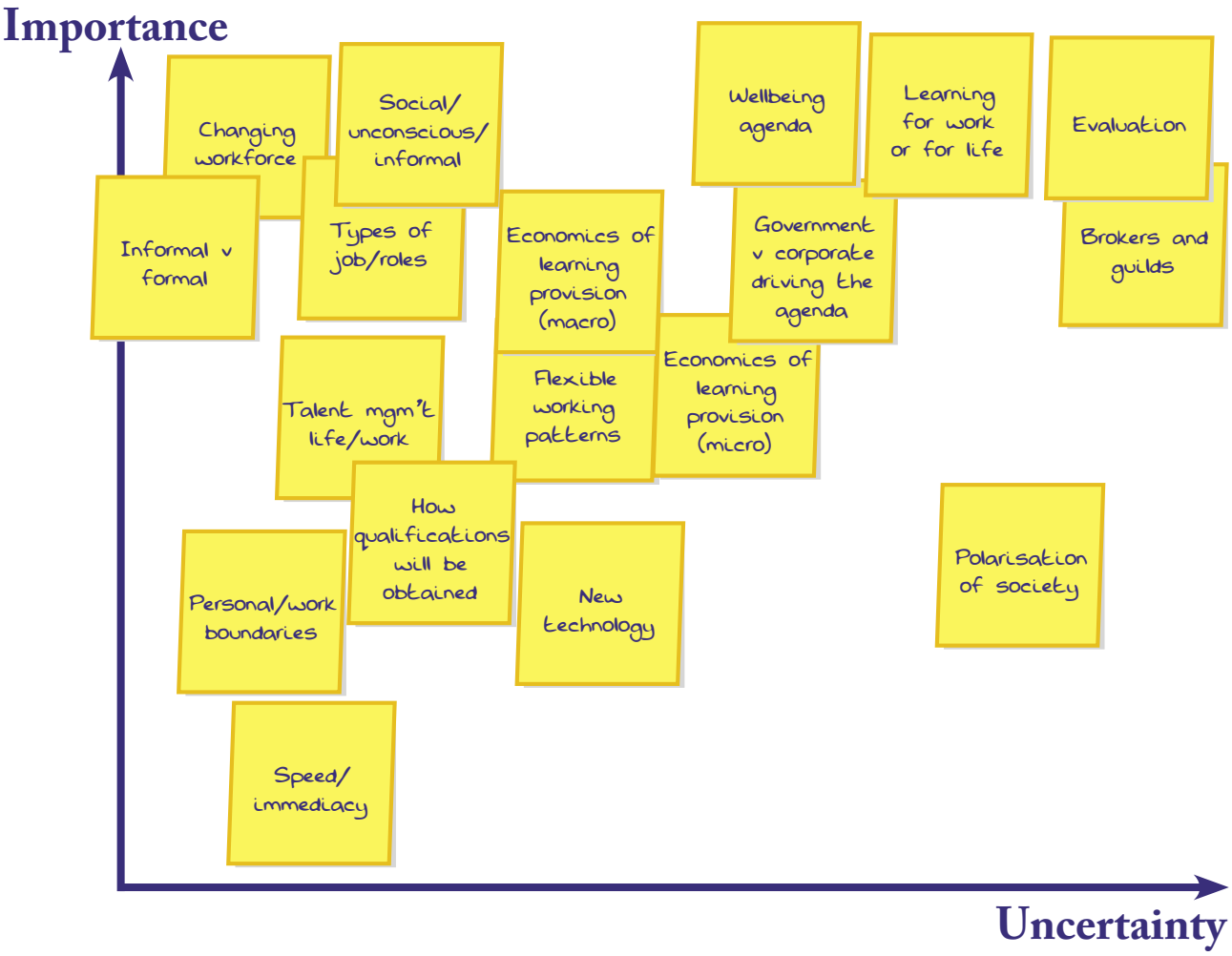
T7. Body area networks (BANs)

T8. Nanotechnology

T9. Artificial intelligence

T10. Genetic modification

Figure 1: Importance/Uncertainty grid



5. The scenarios

5.1 About scenarios

As can be seen from the original 36 themes and the importance/uncertainty grid, there are very many factors to consider when thinking about the future of L&D. Probably too many for most of us to consider at one time!

A recognised approach for dealing with a wide range of factors where there is high uncertainty about some of them is that of using scenarios to describe the future. Scenarios are really just rich descriptions of how different futures might look – they are not predictions but are alternative possible ways that the future might evolve that can be used to facilitate a discussion about how organisations or individuals might respond in a particular scenario.

One of the goals in having scenarios is that they provide a manageable number of different situations for people to think about – usually between three and five scenarios are developed. Scenarios are usually designed around those factors that have the greatest uncertainty and the highest impact, with the other factors incorporated in the scenarios where they most naturally fit the emerging story.

Looking at the importance/uncertainty grid for the current project, we see that evaluation (or perhaps demonstrating impact), learning for work or life, government or corporate influence, well-being agenda and brokers & guilds are the factors in the top right hand corner of high uncertainty and high importance.

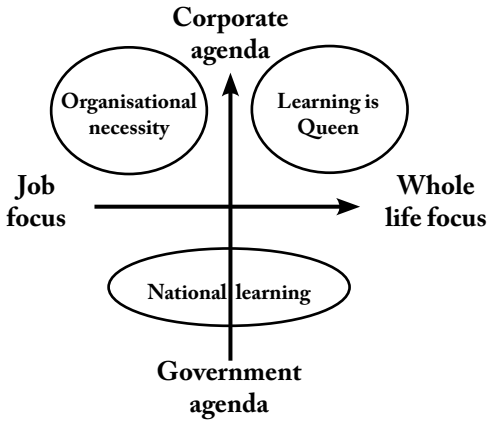
After some discussion, we decided to create three possible scenarios as alternative, distinct views of the future. They are designed to describe relatively extreme situations that might emerge rather than the middle ground.

The three scenarios at a very high level are as follows:

- L&D is queen – impact of learning is clear and learning & well-being are highly important for organisations, learning is for whole life not just work
- Organisational necessity – economy and competition is tough, learning is focused on just immediate work issues and is seen as a cost to be contained
- National learning – UK Plc is struggling and the government is driving the learning and well-being agenda, companies are reluctant to invest in training

For simplicity, these can be thought of as lying on a simple two axis area where the axes are:

- corporate vs. government driven agenda
- job vs. whole life focus



5.2 The scenarios

5.2.1 Learning is Queen

In this first scenario, L&D is genuinely embraced as a driving factor in business success and individual fulfilment. L&D activities are not seen as purely remedial for fixing people's weaknesses but are regarded as an integral part of people's on-going growth and contribution. The impact of L&D on organisational performance has been clearly demonstrated so that the focus is no longer on whether development activities deliver a return on investment, but more on how to maximise the benefits of that investment.

As the age and values base of the workforce has shifted, organisations are much more effective at understanding the needs of different groups of people such as different

generations. They apply sophisticated segmentation and analysis techniques, as well as tailored one-to-one discussions, to help identify the best development programmes for people. Individuals see that an on-going programme to help them fully achieve their potential is an essential ingredient when deciding where to work. Self-employed people and small business owners also recognise the critical role of L&D and invest significantly in their own personal growth plans.

L&D is not focused just on those activities that will help someone do their job better but is more broadly aimed at how to help people lead fulfilling and happy lives as well as contributing even more to the organisation and society. Organisations, recognising the importance of having the best people and developing them further, take an active interest in people's lives and for their key talent pools may take a materialistic approach to managing their lives, perhaps providing high-quality corporate housing and other services to encourage people to stay with the organisation.

Changes in technology and the globalisation of many businesses and markets mean that the traditional work/life boundaries have blurred even further with people balancing the business requirements with their lifestyle patterns. Working away from the office, be that at home or on the move, becomes the predominant work pattern for many. This leads to different styles of management being developed for getting the best from these workforces. Individuals also need to develop their own skills in managing their work/life boundaries and balance.

Whilst training time away from the job is still used (but significantly reduced) for introducing new skills and knowledge, it is recognised that the best learning is achieved through planned experiences and unplanned opportunities in which people unconsciously and implicitly develop greater capabilities. This learning is made more conscious through activities such as coaching, mentoring and action learning. Individuals are now more skilled at learning from other people who they see as role models for the particular thing they are looking to develop. They also tap into the highly developed social networking communities both within their own organisations and in their broader subject areas to learn the latest or best ideas in a certain area. Given the rate of change being experienced, this is often on an as required basis rather than through planned learning activities. Sharing their own skills and knowledge with others becomes a key element of people's own activities. Larger organisations look to find ways to get this learning accredited leading to formal qualifications for people who engage in continuous learning.

As L&D becomes less based on set piece interventions and becomes more on-going, social and informal, the boundaries between the L&D and Organisational Development (OD) disciplines blur even further. At the core of business success and organisational change is the need for the people to learn and develop, and this learning is embedded in the change processes not seen as programmes or courses that people go on. With the evidence that L&D (and OD) make a demonstrable strategic impact on business performance, the L&D/OD function has a seat at the top table on a par with the CFO.

Given the recognised breadth and depth of the impact of L&D, the focus of measurement and evaluation is now on a wider range of measures than simple return on investment. In many cases a balanced scorecard approach is taken to the measurement of L&D, looking not just at the organisational dimensions but also the individual ones too.

5.2.2 Organisational necessity

Whilst markets are competitive in all the scenarios, they are particularly tough in Scenario Two. Competition is very hard and organisations are focused on keeping costs down. Although learning is recognised as important, it is also seen as a cost in both time and money.

In this environment, L&D activities are focused on the skills and knowledge that are required to do the immediate job. Gaps are identified and low-cost programmes put in place to plug them. The immediate feedback from investing in any development has to be clear to whoever is paying the bill through providing a demonstrable change in individual or business performance. L&D interventions become very transactional; what will I get for my money? There is little or no sense of investing for the future and certainly not in anything that isn't directly relevant to business performance.

The focus is on the two key elements of cost – time and money. How can we do the development in the least possible time and for the smallest amount of money? This has focused people on new modes of delivery that take less time. Just-in-time learning becomes a part of life as intelligent systems recognise when people have the opportunity to learn and provide feedback on what they have just done and appropriate suggestions for how to improve. As development needs are recognised, employees are provided with short, technology-based learning modules – these will typically be 30-90 minutes long and delivered on-line, via mobile phones or hand held devices or as podcasts.

Where some form of personal interaction is called for in the development process, this is again facilitated by technology using telepresence or virtual presence approaches. Telepresence takes video-conferencing to a new level with 3-D holograms and high quality images making it seem that the other person is really there. This can be used for developing soft skills and for providing one-to-one coaching much more cost effectively.

Learning will also happen through virtual worlds with individuals visiting the virtual world to meet people from other locations, listen to training presentations and interact with the other participants. Simulations and business games are delivered using technology allowing people to experiment in safe conditions. With the focus on cost effectiveness, organisations access much of the technology on a pay-as-you-go basis, only paying for what they use. Small businesses and sole practitioners are also able to learn using the same service providers.

Some organisations have decided that it is too difficult and expensive for their staff to learn everything required to do their jobs in an increasingly litigious society. They have gone down the route of using neural implants to ensure that staff have the right knowledge to give customers the correct answers. Although somewhat controversial, smart drugs are handed out to staff at the start of the day to get them into a productive state of mind and to help them manage (control) their emotional responses to difficult situations.

In this highly competitive world, organisations have reduced staff costs to a bare minimum and consequently there is fierce competition for the available jobs. Businesses use this situation to their advantage by expecting people to do significant chunks of their learning and development in their own time, and at their own cost. Those who aren't employed have to invest for themselves to ensure that they are best positioned to take advantage of any opportunities that do arise.

5.2.3 National learning

Recognising the growth of the BRIC nations (Brazil, Russia, India and China) and the potential impact that they will have on the UK's ability to compete, successive governments have put skills development at the heart of their strategies. The UK is just about hanging on to its position in the first division of labour capability but is having to fight ever harder to attract inward investment. At the same time there has been increasing convergence amongst the leading political parties that economic success is not sufficient for a thriving country – a focus on well being and personal fulfilment is also important. However, it is the relatively newly formed Liberal Social Party (LSP) that has really driven this broader agenda and its innovative policies have led to its recent election successes and the forming of a new government with Gross National Well-being sitting alongside GDP as a key measure.

As a result of the increasing competition from overseas, many more organisations are operating on a contractor model, only hiring in people when they need them; be this for a few months or a few hours. They are looking for people who have the requisite skills and fit with their brand. As a result of this model, there is a significant increase in self-employment and temporary work leading to difficulty interpreting traditional employment figures. Some organisations retain the traditional model and employ large numbers of people but more and more are based on a small central organisation with outsourcing to suppliers of some elements and use of contractors for others, allowing them to be highly fleet of foot in responding to the global business challenges.

Of course, the rise of new technologies and globalisation of many businesses mean that opportunities to work will not just be available with UK based employers but also for overseas organisations. However, this also means that competition for contract work will come from the global arena too. Whilst some people love the new found freedom offered by the new employment model, others find it hard to cope, preferring some kind of attachment to an organisation. Employment brokers and occupational guilds respond to the needs of these people by providing a wide range of services to not only help people find work but also maintain social contact and manage their lives more broadly. These are where many people now place their first allegiance.

Managers and leaders in the employing organisation have developed new sets of skills and capabilities to help them shape a cohesive workforce out of this contract-based labour pool, requiring highly honed people management and motivational skills, including the ability to manage people from different cultures. Leaders in brokers and guilds also have these skills as they find that they need to manage and motivate their individual clients or members.

With this disparate labour market, employers are less prepared to invest in individual's development and so the Government pushes the learning agenda and invests in educational establishments and also incentives for employers. It is now clearly recognised that employability is not just about skills but also individual's mindsets and significant effort is put into shifting these habitual ways of thinking. At the same time Government is also highly focused on the well-being agenda and implements a range of measures nationally to track well being, and encourages employers and brokers/guilds to do likewise. In additional to the well-being focus, there is continued attention to the environmental agenda and Government is also working to ensure that organisations contribute effectively to an improving climatic and environmental situation.

Society has become increasingly polarised in this individually competitive world where those who get work find even more and those that don't get increasingly marginalised. This latter group of people are also those for whom access to the latest technology is difficult and hence they struggle to develop the skills required by employers. Back to work or employability initiatives take on a new shape, as the predominant model is one of temporary employment for a variety of different employers.

6. Emerging conclusions

6.1 Overview

Whilst the scenarios present three separate futures, it is likely that all three will emerge to varying degrees, depending on the business climate and individual organisation's own business models. Indeed, all three may co-exist in the same organisation depending on the specific learning and development requirements of different groups of people.

Having explored the possible implications with a number of groups of L&D professionals, it seems clear that several key themes are starting to emerge and these are described below.

6.2 Direction of travel

Some of the ideas in the scenarios have proved quite challenging and thought provoking for some of the workshop participants (as they were intended to be). However, whilst there will be changes over the coming five to ten years, these changes will be along routes that have been previously identified and discussed in the L&D world, but are now expected to have a significant impact. This is likely to lead to a change in the balance of L&D activity rather than a complete new way of working – evolution rather than revolution (albeit rapid evolution).

In addition, the speed of movement along these new routes is increasing as elements of the skills and knowledge needed to be successful in many jobs change faster. There is no longer always one central repository of the 'right' knowledge or skills; it is dispersed amongst experts spread across an organisation or even in other organisations. Businesses are looking for more responsive and more targeted solutions to their L&D requirements, and technology is facilitating new ways of working and learning.

It is becoming harder to anticipate what new skills and knowledge will be required and put in place a structured programme to deliver it; problems (or opportunities) will occur in organisations and solutions will need to be found, rapidly. The people involved will need to learn about a new area and create a solution much more rapidly than previously – the learning curve will need to be much shorter and people will be going up new learning curves on a regular basis.

6.2.1 Continuous, informal and social

Learning will continue the shift from being just thought of as formal, away from the office, programmes to an on-going process where learning is continuous, social, informal and embedded in the workplace. People learn all the time, it is almost impossible not to learn on a daily basis, but many people only think of development as having happened when they have been formally trained in a particular area. As the knowledge required for many jobs changes more rapidly and becomes more dispersed, it won't be practical to help people learn all that they need to in this way.

At the same time, different generations are interacting differently with work and in an article in the summer 2008 edition of Learning Magazine, David Wortley of The Serious Games Institute suggests some interesting differences between the generations. (See table on page 16.)

Whilst these are obviously generalisations, it mirrors many of the ideas emerging from this research and emphasises the importance of collaboration and independence as key elements of learning in the future. More traditional models of classroom based or facilitated learning may still have their place, particularly for regulatory, core skill set and/or brand values-based development. It is likely though that their role will diminish for other types of development as people draw on their network of contacts or use technology to access relevant learning material on a just-in-time basis.

The challenge for organisations is how to help people learn most effectively in these connected and independent ways which will allow the rapid spread of knowledge as and when required, perhaps recognising that they can't control this process but can create the right conditions for it to occur.

6.2.2 The importance of technology

It is tempting to think of some of the advances in technology as just new delivery mechanisms delivering the

	Traditionalist	Boomer	Generation X	Generation Y
Training	The hard way	Too much & I'll leave	Required to keep me	Continuous and expected
Learning style	Classroom	Facilitated	Independent	Collaborative & networked
Communication	Top down	Guarded	Hub & spoke	Collaborative
Technology use	Uncomfortable	Unsure	Can't work without it	Unfathomable if not provided

Source: Learning Magazine, summer 2008 – The Changing Landscape, David Wortley (partial table)

same content in new ways. Indeed, some of it may be just that, an extension of e-learning to m-learning, podcasts, and so on. However, even these provide opportunities for people to learn at different times and in different situations than they did previously, accessing the required material exactly when desired or required. Technology will also provide increased opportunities to deliver content on a just-in-time basis, combining recognition of a development need with timely delivery of just the right content.

More fundamentally though, recent advances in technology have helped people connect and collaborate more easily with a wider range of colleagues. Always-on internet connections make it possible for people to interact and learn wherever and whenever they need to. This isn't just about delivering the same content in a new way but providing ways for people to seek out and find learning for themselves, be that through accessing existing knowledge or tapping into a network of contacts (or their contacts). People also have the opportunity to contribute their own knowledge to the global knowledgebase as well as drawing on it for their own use.

These networked uses of technology require a different way of thinking about learning which isn't about content delivery necessarily, but more about providing the means for people to find and share information for themselves. Understanding the psychology of relationships and networks will be fundamental to creating effective learning environments.

6.2.3 Recognising the value of learning

One of the challenges of a world in which more learning is on-going, independent, social and informal or just in time and bite-sized, is how to recognise that people have learnt new things. This is important both to help people acknowledge that they are already learning (and perhaps don't need to go on a training course) and also so that they can demonstrate their learning to other potential employers. As one workshop participant commented "I am learning all the time at work and I don't have time to go off and do a Masters degree. How can I get accreditation for the learning which I am already doing?"

And, this is a very good question. How can employers and academic institutions establish accreditation processes which recognise and value these new styles of learning? How can this learning be made portable to, and valued by, other employers?

6.2.4 Learning as a skill

A key message that came from the workshops was the importance of individuals taking responsibility for their own learning and not expecting organisations to 'drip feed' them. Throughout the education process most people have a clear structure provided for what to learn and yet, in the world of work, there is not a similar clear path (apart perhaps from the requirements of professions such as accountancy, and so on, although even these paths come to an end at some point).

Learning as a skill was identified as being very important and one that many people haven't been helped to acquire. Participants' envisaged situations where learning capability could be used as a key factor in recruitment selection processes for certain roles, equal to or more important than the knowledge to do the job today.

Helping individuals develop their learning capability and desire to learn is seen as a key priority for both organisations and the education system.

6.2.5 Critical role of the line manager

Whilst helping individuals develop their learning capability is seen as a high priority, so is developing the ability of line managers to help in the learning process. Not everyone can learn totally independently and the coaching skills to help people think through what to learn and to reinforce the learning that has taken place will be essential to optimising the learning that occurs. The line manager also has the responsibility for focusing the learning on skills and knowledge that are required for success and progress in the current organisation/role. A further important part of this role is the manager passing on their own knowledge and experience when that is appropriate; a combination of coach, mentor and teacher.

As many organisations are recognising, this part of the manager role does take time and needs to be valued. However, sometimes whilst the role is

specified for the manager the time pressures of the job mean that they are not able to give it the necessary attention. It is also worth noting that not everyone is a natural people manager or coach, and that often people end up in management roles because it is the only way to progress in the organisation rather than because they actively desire people management responsibility, and consequently the people elements of the role can be neglected.

6.2.6 Opportunity for L&D functions
As learning becomes even more on-going, social and informal and at the same time is increasingly being recognised as key to organisational success, the nature of L&D changes to one which is much more integrated into an organisation's culture and ways of working. Organisations will need to be designed (structure, processes, technology, physical space and culture) to enable people's learning and to allow them to put that learning into practice. As a consequence, the boundaries between L&D and Organisational Development (OD) will blur.

Many leading organisations have already started down this route and yet other L&D functions are still focused on delivering the formal classroom-based training, blended or e-learning modules. Some commentators (such as Jay Cross in his book *Informal Learning*) estimate formal learning at only 20% of all learning that goes on in organisations. Whatever the accuracy of this percentage, it is clear that there is much learning happening that many L&D functions are not either responsible for or even involved in.

Whilst the future portrayed is one of evolution rather than revolution, the opportunity is there for all L&D functions to work with, or join with, the OD function to really focus on enhancing the capability of the people in the organisation and the organisation's ability to deploy that capability. When this opportunity is fully seized, the L&D/OD function can be a powerhouse of influence in organisations and be a major driver of organisational success. The question for L&D leaders is whether they want to seize this opportunity.

6.2.7 Measuring the effectiveness of L&D
Measuring the effectiveness of L&D interventions is challenging at the best of times. As the focus of L&D shifts towards creating learning environments that encourage collaborative, informal learning in which it is the networked impact of different elements that makes the difference, this will become even more difficult. Certainly 'happy sheets' won't do it!

We can do customer satisfaction surveys, for example, what do you think of the intranet, web-based virtual meetings or the Second Life learning community. But how do you measure the effectiveness of these initiatives which will grow over time as the networked effect multiplies and, potentially, extends outside the organisation. Perhaps the answer lies partly in the blurring with OD and is in the measurement of overall capability and capacity of the organisation through understanding the behavioural drivers of business performance and using some form of balanced scorecard.

Despite its difficulty, measurement will continue to be important as it may be possible to invest significant time and effort in initiatives which deliver no real business benefit. The challenge will be in isolating those that do from the ones that don't.

6.3 Possible implications for L&D professionals

For L&D professionals the emerging conclusions described above raise interesting questions about the skills that will be required in the future and possible career paths. Again, the changes required will be about evolution rather than revolution and the speed of change will vary from organisation to organisation.

At the final workshop of this first phase of the project, we spent some time considering the skills that L&D professionals might require, possibly as a team rather than as a single individual. The table (see page 18) sets out the skills that were identified.

Whilst, at first glance, this list may not seem that different from the current L&D skillset (or perhaps it does), there are a number of factors that do distinguish it.

The level at which L&D will need to operate must increase for it to achieve the desired impact. This is reflected in the first element above which is strategic business understanding and analysis. As the HR function has been working towards over recent years, the L&D function will need to be able to think about how it can lead business changes through the application of L&D rather than just responding to specific business problems that are presented to them.

Some practitioners will also require skills that will allow them to initiate and manage change to enable the organisation to benefit from the social, informal, networked approaches discussed earlier. This will require skills which are perhaps more closely aligned with existing OD roles but will also require the practitioner to understand the opportunities afforded by the latest ideas and thinking (hence the innovating and researching skill set).

Finally, there will be a shift in balance between the required skills with a shift towards those just described and, in particular, the first four in the table (on page 17).

Future L&D skill requirements

Strategic business understanding and analysis

Designing OD style L&D solutions

Initiating, managing and embedding change

Innovating, researching and horizon scanning

Diagnosing business situations

Objective setting and evaluation

Marketing the L&D capability

Managing suppliers and contracts

Creating and managing learning infrastructures

Designing specific discrete interventions

Delivering – coaching, facilitating, training

Appendix – The trends

Society

How will changing demographics and workforce mobility affect the nature of learning required?

S1. Changing demographics

In January 2020 the Department for Work and Retirement published a report outlining the following UK trends[1]:

- workforce has grown by 600,000 since 2010. More than 60% of the growth has come from women entering the workforce, of whom 1 in 4 are mothers
- 3 workers to every non-worker, compared to a 4:1 ratio in 1990
- 16 million people in the UK aged 20-40 and 17 million between 45 and 65. In 2000 17 million people in the UK were aged 20-40 and 14 million between 45 and 65
- 10% of the workforce comes from ethnic minority groups
- 25% of families are single parent
- 10 million people have some responsibility in caring for elderly relatives.

Ethnic plurality is now commonplace. Around a dozen towns and cities in the UK will not have a single ethnic group in a majority within the next 15 years. Leicester and Birmingham have already become the first 'super-diverse' cities, soon to be followed by Slough and Luton[2]. Leicester's white population has fallen from 70 percent in 1991 to less than 45 percent today.

But immigrant and ethnic populations are no longer characterised by large, well organised Afro-Caribbean and South Asian communities. Instead, increasing numbers have arrived from all across the globe – from Mexico to Madeira and from Australia to Austria.

World population has grown more than expected earlier in the century, due to medical advances and longer life spans. Fertility rates in the developing world have continued to rise as has longevity in richer countries. These factors continue to contribute to a higher than expected rate of population growth. As a result, the UN has increased its forecast for global population from 9.1 billion people by 2050 to 9.2 billion[3].

Currently, the large number of Baby Boomers is creating an ageing industrialised world. This trend is occurring across most of Europe and Japan. The USA is ageing the least rapidly because of its high immigration, both legal and illegal. This increasingly elderly population is putting enormous stress on social and economic systems worldwide – even worse in countries that are ageing faster, such as Japan and Italy.

Although Baby Boomers have reached retirement age, many continue to work – either through choice or the necessity of extra income to supplement inadequate pensions. Organisations have long been aware of the likely knowledge outflows once their Boomers retired; many have still been caught out. Although technology has captured informational data, organisations have been slow to transfer key tacit knowledge. For those Boomers wishing to remain on the payroll, this is proving to be the 'last laugh' following years of downsizing in the 1980s and 1990s.

Forward-looking organisations were developing programmes and procedures to retain the knowledge of retiring Boomers from the late 1990s onwards. Many have alumni clubs that continue to tap the expertise of former employees – at both face-to-face events and virtually.

Young people are staying longer in education, partly to evade work responsibilities, and are leaving child rearing until later in life. Many are coming out of full-time education into what they consider to be temporary jobs while they save enough money to travel 'before settling down'.

Many older people are taking advantage of their good health to enjoy a lengthy retirement. However, today's local authorities, central government and other public bodies are constantly being taken to task by a well-educated and articulate grey population with the time to research and mobilise around issues of concern.

Healthcare has been transformed by biotechnology and genomics. People are living longer, healthier and more productive lives. The human enhancement marketplace, offering new organs, new memories, new limbs, new skin and new lives, has translated into the largest consumer market[4].

1. Extrapolated from 'Britain in 2010', Department of Work and *Pensions*, 2001
2. *http://www.guardian.co.uk/society/2007/dec/23/communities.population* 12/07
3. World Trends & Forecasts, Sep-Oct 2007
4. *http://www.futureguru.com/10trends.php*

S2. Globalisation

For more than 30 years, the world has been experiencing the new realities of more open global trade. Even at the turn of the millennium, India was already well set to move centre of the trade stage, with China waiting in the wings. Now both countries are global trade giants.

Across Europe, the brain-drain of 2000-2010 is reversing as Eastern European workers start to return home to set up and lead corporates, building on expertise gained in several sectors[1].

Thriving entrepreneurship, fuelled largely by immigrants, is a key feature of the global scene and immigrants have turned to entrepreneurship to overcome traditional workplace entry barriers. Although immigrants often bring education and professional experience to an adopted country, their knowledge assets have not always translated into value across cultures. As a result, they often find it easier to start their own company[2].

The world is already ahead of the 2007 prediction of a billion millionaires by 2025[3] brought about by globalisation and technological innovation – many still only budding entrepreneurs back in 2007.

Organisationally, cultures still have their clashes, but people are working harder to overcome these differences – often driven by commercial pressures to do so. Many people in 2020 are now working across global borders far more than their parents ever imagined possible. Knowledge workers, in particular, are well-connected to networks around the world.

The web has fostered grassroots globalisation – from children in Thailand viewing online lectures to doctors in Africa seeking medical advice from a surgeon in Sweden. As cybercultures have developed in the emerging economies at the turn of the century, they have not developed to become replicas of western websites. 'Virtual India' quickly followed 'Virtual China' (*http://www.virtual-china.org*) and spawned a host of copycat sites creating new zones of experimentation and innovation.

Some companies, such as those in the oil sector, have been moving their executives around the globe regularly for many years to develop truly 'global managers'. But others are still playing catch-up. Banks followed the oil companies in the wake of several global mergers, de-mergers and re-mergers. While 'corporate man' is alive and well and willing to sacrifice family life for a lucrative move, others are questioning the need for such a huge upheaval in today's 'wired world'.

1. *http://www.pwc.co.uk/pdf/managing_tomorrows.pdf 2008*
2. Intuit Future of Small Business Report, 01/07
3. The Extreme Future, James Canton, 2006

S3. Generational values

Several generations are coming together across the whole spectrum of employment. Many old Baby Boomers are still working, in spite of being past retirement age. Generation X are 'old hands', while Millennials (Gen Y born between 1982 and 2000) now make up a significant percentage of the working population.

By the turn of the century, many Baby Boomers had become dissatisfied with corporate life after having experienced serious downsizing. As a result, they often turned to employment alternatives such as small entrepreneurial businesses, social causes and contract working. Now ageing, many Boomers are keen to enjoy their retirement and are releasing funds from the sale of their property to do so.

Features of Millennials:

- use technology to interact with services, government and work. They place an emphasis on choice and are anti-monopoly, which is encouraging constant innovation[1]
- prove false the assumption that young adults are always more alienated and risk prone than the generation before. They want to correct for impractical Boomers and undisciplined Gen Xers[2]
- develop community norms based on rules, standards, and personal responsibility. Every arena is now more mannerly, structured and civic-minded. They are closer to parents than Boomers and Gen Xers were at the same age[2].

Pop culture is bland and mainstream. Young film stars display more modesty and bring new civic purpose to screen violence. As in the old Disney's 'High School Musical', stories and songs are upbeat and team-orientated, but lack depth[2].

As digital natives, the lives of Millennials are highly inter-linked. They are constantly forming relationships with a select but changeable group of peers through social networking. In their web-based, information-rich world, multi-tasking is the norm. Postal services, except to receive goods ordered online, are dead to this generation. Email is the new snail mail – it takes far too long and excludes other people in the network.

In public cyberspace, Millennials use information to empower groups rather than individuals. They have developed new standards for social networking, identifying a clear range of acceptable online attitudes and behaviors. Virtual communities are constantly serving the needs of young adults, from finding jobs to buying houses. They depend on online communities similar to the old Craigslist and Freecycle to help them set up their lives after college[2].

Millenials value both self-reliance and cooperation. Self-reliance because individuals can no longer fall back on social-security, pensions, or other benefits, and cooperation because they believe group action is often the best way to lobby or optimise the use of scarce resources[3].

Now a political powerhouse, Millennials mass to support elders who translate spiritual resolve into public authority. They reject the negativism, moralism, and selfishness of the national politics they witnessed as children. They are liberal in wanting governments to aggressively protect the community, strengthen the middle class and reduce economic risk. They are also conservative in their life goals and respect for rules[2].

But social reforms have not always come fast enough in the developing world. Disappointed expectations continue to drive youth emigration to more developed countries – and underemployed young people into fringe political and religious movements. This is bringing new waves of terrorism and instability to the economies of target countries[3].

1. http://www.pwc.co.uk/pdf/managing_tomorrows.pdf
2. Managing for the long term. Neil Howe and William Strauss, Harvard Business Review, July-August 2007
3. 53 Trends Now Shaping the Future, World Future Society (2005)

S4. Technological lifestyle

The growth of the information industries has created a knowledge-dependent global society where computer power is ever more portable and ubiquitous. The always-on mobile world with its smart materials – where we do not need to leave our armchair to visit others across vast distances – is changing our lives, culture and economy. Technology advancements are leading to new jobs, new products and new options[1].

Imagine these technologies in your home[2]:

- organic robots formed from a convergence of genetic modification and robotics
- home and office robots for cleaning, washing, and fetching
- garden robots for plant care and tidying
- anti-noise technology in gardens
- patio display panels and slabs to simulate a beach or forest
- remote-control devices built into pets
- holographic TV
- films where viewers can choose who acts in each role
- 3-D home printers.

Entire cities now rely on high-speed wireless networks that allow commercial transactions, entertainment and communications to be handled by every individual on credit card size devices. Pinpointing exactly what you want and being shown its availability wherever you are is now taken for granted. This enables businesses to continuously refine and individualise their relationships with consumers, employees and shareholders[3].

Fashion has gone wired, as technologies have revolutionised textiles and revitalised the textile industry in the USA and Europe. Researchers in smart fabrics and intelligent textiles (SFIT) have been working with the fashion industry to bring colour-changing or perfume-emitting clothes, wristwatches that work as digital wallets and running shoes that watch where you are going – and allow others to do the same[4].

Digital devices are increasingly making our everyday decisions automatically – from room environments and the food we eat, to the drugs we take. On a wider scale, electronically enabled network teams, robots with artificial intelligence and other devices are making financial, health, educational and political decisions for us. This is because technology is increasing the complexity of our lives, but our competency is not keeping pace well enough to avoid disasters from human error[5].

Published in January 2020, a report from 'Tech Watch' claims there are now more robots than people in developed countries[2]. But the increase in technology is leading to an anti-technology backlash and holiday makers often prefer to take their breaks in no-tech, or low-tech, environments. Holiday companies are urging consumers: 'Visit a tech-free environment – for real. Try the excitement of thinking for yourself!'

1. http://www.futureguru.com/10trends.php
2. A Timeline for Technology, World Future Society (2006)
3. http://www.pwc.co.uk/pdf/managing_tomorrows.pdf
4. http://www.wfs.org/Sept-Oct07%20files/Visions.htm
2007
5. Not With a Bang: Civilization's Accelerating Challenge, Arnold Brown (2007)

S5. Knowledge society

We have long been accessing advanced information and communications technologies. These have profoundly changed our learning processes and how we use, create and share knowledge. Although work became knowledge-intense many years ago, the same intensity has been occurring across wider society since the turn of the century.

People can now package even material objects in virtual layers of software and information, turn them into informationalised artefacts and link them to the web. Our physical spaces are blending material, informational and communicative structures and functionality[1].

While productive knowledge activities have tended to concentrate in geographical regions, knowledge is globally distributed and linked via the web's power and mobile communications technologies. People increasingly need to process new knowledge and mobilise socially and geographically distributed resources. As a result, 'knowing' has become an increasingly dynamic social phenomenon. Everyday knowledge needs to be reproduced, created, and recombined fast – and in problem contexts difficult to imitate in educational institutions[1].

Rote learning of facts became redundant many years ago once everyone had access to ubiquitous networks of information. Learning and knowledge creation skills have moved from being an essential in the workplace to being a fundamental skill for life. People regularly access bite-sized information via the web to fulfil an immediate learn-on-demand need in their daily lives. For example, 'who is...', 'when was...', what is...', 'how to...', 'where can I...' are regular queries.

Once the domain of the corporate world, individuals can easily access professionally produced e-learning packages. These are now more affordable due to the global reach and popularity of the best known providers, which has increased income to offset production costs. In addition, providers have miniaturised larger programmes and re-packaged them to produce micro-payment products.

While on the one hand, anyone can become an expert given enough application, more traditional experts are thriving in today's knowledge society. They help sift the vast quantities of knowledge available to provide guides to what is reliable and synthesise the thinking of others. People today expect to learn for themselves, regularly becoming expert on topics ranging from roses to 'green' home building. Ever more hobbies are supported via online global chat forums, websites and wikis.

For the professional, guilds have been re-emerging in various global online forms. Becoming ever more important, these guilds have taken on many responsibilities previously assumed by employers such as sourcing talent, medical insurance, pensions, development and training. People join guilds for continuous professional development and to access opportunities through portals provided by guild networks where work is also traded[2].

Public knowledge is continuing to invade the once tightly regulated world of journalism. Citizen reporting began to emerge at the turn of the century and is now a recognised link between traditional media and civic participation. More than simply a news source, citizen media sites fuse news and views. Although privatised, the BBC continues its support of citizen media and 'Financial View' is the new pink-edged public contribution website from 'Financial Times Online'.

A citizen media site often reflects life in a particular geography, typically with a rolling front page where posts go up in blog-like chronological order. Many display professionally produced local coverage originated by paid staff, imported from an owner news site, or by volunteers.

Citizen postings take centre stage on some sites or are relegated to 'comments' on others. Sites also feature event calendars, tutorials on how to contribute text and images, local blog feeds, and government and business directories[3]. The popular website 'uNooz' includes poetry, creative writing, gardening, sports, global headlines and vast photo galleries.

1.http://www.meaningprocessing.com/personalPages/tuomi/articles/TheFutureOfLearningInTheKnowledgeSociety.pdf 2005
2. http://www.pwc.co.uk/pdf/managing_tomorrows.pdf 2008
3. http://www.j-lab.org/citizen_media.pdf 02/07

S6. Environmental concerns

The increasing energy crisis and looming post-oil future are weighing heavily on society's mind in 2020. Although we now have several energy alternatives such as hydrogen, hybrids and biofuels, they are still not sufficient to meet the planet's growing energy demands. Energy's critical role is shaping many aspects of our lives in the 21st century – from business to global society.

In spite of scientists' dire warnings at the end of the 20th century, too little has been done too late to prevent the environment from changing further – increased global warming, pollution and threats to biodiversity. But these threats are also presenting new business opportunities, while the 'clean tech' market is offering start-up companies financial opportunities to clean up the planet[1].

A new 'cold war' is escalating between Russia and the USA as rising prices for natural resources are leading to a full-scale rush to develop the Arctic for oil, gas, nickel, copper, zinc, coal, freshwater, forests and fish. Arctic states are fighting a losing battle in trying to control these commodities and find sustainable ways to share them[2].

For more than 10 years, 'blue' has been the new 'green' as water in the 21st century became the 20th century's oil equivalent. In spite of increased flooding, global fresh water shortages and drought conditions are spreading in both the developed and developing world. In response, the dry state of California, for example, built 13 desalination plants in 2010 that are now providing around 20 percent of the state's needs. Desalination is now as main stream as coal-fired power stations once were[3].

Businesses are continuing to embed sustainability in their governance structures, for example, with board-level sustainability expertise and environmental performance targets for CEOs. Many have designated environmental members – a government requirement for mining and timber – and annual sustainability ratings are regularly being used as a benchmark for awarding government contracts[4].

The environmental lobby is so pervasive that companies must react quickly to consumer concerns about any aspect of their business which could be deemed unethical. To support this increased outward focus, many companies have renamed their networked personnel teams 'people & society'[5].

Employees are actively seeking companies whose corporate responsibility stance reflects their own values. Companies have become alert to the rise of these 'ethical employees' who want to work for a greener employer. A survey in January 2020, by recruitment portal 'Search4Me', found 85 percent of job seekers actively wanting to work for firms with strong environmental credentials. By the same token, firms such as fossil fuel-reliant industries have become 'toxic' employers.

Since 2018, a company's carbon footprint has also included employee miles as well as supplier miles. Generous company tax breaks for low carbon footprint organisations have led to more homeworking initiatives and the virtualisation of work. Where people must work physically together, many companies have relocated to city centres and today occupy old shopping malls following a decline in the need for large physical shopping spaces.

Improved communications technologies have also reduced air travel dramatically, as has the increased threat of terrorism. The height of the lethal flu pandemic of 2012 gave homeworking a further boost as people refused to use public transport.

Last year, 2019, BT once again won the 'Best Green Supply Chain Award', following a similar win in 2007. Then, the company equipped 13,750 home-workers and 64,000 employees to work from home and office, massively reducing CO_2 emissions. In 2007, one million face-to-face meetings were replaced by two million conference calls saving a further 97,628 tonnes of CO_2 emissions – a number almost doubled in 2019 due to BT's expansion through extensive global partnering.

From a strategic perspective, an important trend is the continued ambiguity of energy choice. As energy sources proliferate, complexity increases and adds costs to business. There are still no obvious single solutions, like expanding into new markets and the best options vary by industry and location[6]. But more than 50 percent of organisations are now using micro-CHP (combined heat and power) stations on their premises to boost energy efficiency[7].

1. http://www.futureguru.com/10trends.php
2. "Thinking about the Arctic's Future: Scenarios for 2040" Lawson W. Brigham, Sep-Oct 2007 (See http://www.wfs.org/forecasts.htm)
3. Technology's Promise: Highlights from the TechCast Project. William E. Halal (See http://www.wfs.org/forecasts.htm)
4. Academy of Management annual meeting 08/07
5. http://www.pwc.co.uk/pdf/managing_tomorrows.pdf 2008
6. A Timeline for Technology, The Futurist, March/April 2006, World Future Society
7. http://www.strategy-business.com/li/leadingideas/li00059?pg=0 01/08

S7. Education trends

Debates on the proper objectives of learning have become increasingly visible in today's knowledge society. To some extent this is because the old educational institutions needed to find new ways to justify and legitimise themselves[1].

The established institutions of learning, particularly the older universities, have struggled since the late 1990s to adapt to the new knowledge society, preferring instead to rely on their deep historical roots. Educational certificates have become increasingly irrelevant as they are soon outdated. Learning opportunities have continued to accumulate fast for some, while creating social differences and digital divides for others. Education institutions and policymakers are still struggling to combine innovation, creativity and equal opportunities[2].

Young people are graded and profiled at the age of 16 and categorised for work suitability in terms of capability and individual preference. As ever, the top talent is highly prized and fought over. In most cases, people are linked to an organisation by the age of 18 and their university education is managed by the company according to the organisational career path the individual has chosen[3].

At the top level, people are taking far greater control of their careers, with senior executives having a personal agent who represents them. These agents find the executive the best roles and deals[3]. Agents often act as old-style coaches, but more actively, to find the best on-going education to meet an often changing career path.

Following the success of companies such as McDonald's offering their own A-level qualifications, many others have followed suit[4]. Like their high level colleagues, lower level employees are also taking active charge of their careers, rather than wait for the company's educational opportunities – such as through corporate universities. These employees understand the value of personal education and are demanding about where they will invest their own time and money. Those working in smaller organisations, or are self-employed, regularly invest in various forms of education, generally online.

Young entrepreneurs see university as a path for education, but not the only solution. On-demand education programmes, customised to their specific entrepreneurial needs, have grown more common. Entrepreneurial education is spreading quickly, for example, MBAs specifically for entrepreneurs. Driven by demand from Millenials, Baby Boomers, and mid-careerists looking to enter small business, entrepreneurial education of all types has expanded over the last decade[5].

Further education college programmes have already begun to provide for this need. Enrolment in college-level business and entrepreneurship programmes has been growing dramatically in the last 15 years. Courses for entrepreneurs have also grown at secondary school level and several lower level qualifications are available in the subject. Many of these programmes are targeting disadvantaged youth. Small business skills are now being taught to artists, musicians, and others not traditionally exposed to business education[5].

Prior to 2010 only 10 percent of higher education was conducted online. Virtual education began to enter the mainstream in 2010 after the strong take-up of e-learning by the corporate world in previous years[6]. Virtual universities have continued to increase following the achievements of early pioneers such as the University of Liverpool (http://www.liv.ac.uk/virtualtour/), but are in competition for a global intake with universities such as Singapore's Virtual University due to the successful Virtual University for Small States of the Commonwealth initiative[7].

Society is concerned that technology is leading to educated illiterates. Widely used and effective voice recognition software has been replacing the keyboard for the last 15 years. We are now well on our way towards a world in which traditional concepts of literacy no longer apply. Education since the turn of the century has been shifting away from teaching reading, writing, and arithmetic and towards encouraging creativity, imagination, and critical thinking[8].

1. http://gtcni.openrepository.com/gtcni/bitstream/2428/7928/16/2020%20Book%20-%20The%20Knowledge%20City%20-%20Paul%20Nolan.pdf
2.http://www.meaningprocessing.com/personalPages/tuomi/articles/TheFutureOfLearningInTheKnowledgeSociety.pdf
3. http://www.pwc.co.uk/pdf/managing_tomorrows.pdf 2008
4. http://www.timesonline.co.uk/tol/life_and_style/education/article3261485.ece 01/08
5. Intuit Small Business Future Report, 2007
6. Technology's Promise: Highlights from the TechCast Project. William E. Halal (See http://www.wfs.org/forecasts.htm)
7. http://www.col.org/colweb/site/pid/100
8. Illiterates with Doctorates, Revisited. Peter Wagschal, The Futurist, Mar-Apr 2007

S8. Consumer society

Continuing the trend of the 1980s and 1990s, purchasing decisions have become increasingly complex – whether a cup of coffee or a pack of plasters. Web purchasing is only adding to the array of possibilities and people regularly tap their online global social networks to give personal recommendations. Consumer choice sites are trying to help by recommending products, but since these sites have also grown in number, they are only exacerbating the problem.

Many older people say they find the amount of choice bewildering, but are learning to use intelligent online search agents to help. Time-poor consumers can feel the stress of choice and online shopping malls commonly provide personal shoppers to steer a way through the buying maze. But techno-savvy youngsters, with their always-on lifestyle, revel in the amount of choice.

Smart manufacturers have recognised the potential from 'Boomerising' their products. Teen-targeted products at the turn of the century, such as the iPod, are being re-designed with older users in mind. Speech recognition software is also helping older people access the web's product chat forums to seek products fitting their needs.

The late 1990s saw the first wave of 'amateur experts' providing user generated content – in wikis, blogs and YouTube. But the pendulum has swung away from amateur wiki content with sites such as Citizendium (*http://en.citizendium.org*), started in 2006, with its stricter editorial policy.

Young people are continuing to become publishers, film makers, artists and song creators. These entrepreneurial producers are blossoming and have become a serious threat to big business. By comparison, these individuals have non-existent overheads, speed and closer links with their consumers.

Ethical consumerism has gathered pace in the wake of reports on climate change, unethical business practices and financial scandals. More companies today are copying Dole Organic (*http://www.doleorganic.com/*) which has been allowing consumers to track produce transparently through their supply chain since the early 21st century.

Self-production has become a trend, started originally by allotment owners. Baby Boomers, in particular with time on their hands, are creating community production units ranging from vegetables to clothing. Homemade clothing, once a mark of the poor, has become cool – and clearly states your green credentials. This trend has not yet affected the developing world, but there are fears it might.

Personal carbon trading has become popular and consumers are much better informed about what it means to be greener. However, the developing world has become concerned at the reduction of 'food miles' for example, which has affected its produce exports when consumers have switched to locally grown vegetables.

Ethical consumerism has risen from the bottom of the business priority pile to the top following several large global warming rallies. This issue has once again come into sharp focus following massive flooding last year (July, 2019) with thousands made homeless in East Anglia.

1. http://www.outsights.co.uk/ See: Outsights on the Consumer, J. Mosmuller, 2007

S9. Global poverty

Before seeking corporate employment, Millenials will usually conduct some careful research on a target company's ethical stance on issues ranging from irrigation in Mexico to developing skills in Chile. This group is particularly keen to work for corporates putting something back into the countries whose resources they are using.

For example, Unilever has been helping the developing world for many years. Hindustan Unilever, for example, has been working to end childhood malnutrition in India by working with UNICEF. By 2010, Grameen Bank and Groupe Danone had established the Grameen Danone Foods Social Business Enterprise in Bangladesh, which is still creating business partnerships with local communities to bring nutrition and alleviate poverty.

Companies are recognising that human rights take precedence over company rights and must not be compromised for profit. One example is Rio Tinto, who reached agreement with the World Bank to jointly fund a huge long-term mining infrastructure project on the grounds of its social, environmental and economic benefits to a heavily impoverished region of Madagascar.

All the BRIC countries (Brazil, Russia, India, China) are considerably richer per head than they were, though they are still poorer than Western economies. The rise in their economic wealth has increased the possibilities of finding jobs locally. However, resources donated by the BRICs to other developing countries (the BRICs' client states) are therefore not invested in the poorest back at home. For the more authoritarian BRICs, looking after their own poor is less important than increasing their global clout.

2000, only three percent of the global population were living outside their country of birth, but this is set to double by 2030.

Several key forces have been driving these flows of people:

- economic factors have drawn poor people into countries needing labour
- ageing populations in rich countries have created vacancies offering immigrants the possibility of a foothold on the work ladder
- the rural-to-urban shift has continued across all developing countries
- global warming has forced millions at sea level to flee to the hills and desertification has pushed people into the cities
- local wars continue to create involuntary refugees.

But there are benefits for the poor:

- increasing pressure for jobs to be done in more acceptable ways is reducing exploitation
- informality is resulting in greater freedom to set up one's own enterprise
- some migrants return wealthier, more skilled and able to make valuable contributions to their countries of origin.

But a worrying question remains after the poor have migrated to wealthier countries in search of employment and opportunities. Who is looking after the dependent poor left behind, including disabled people and marginalised ethnic groups? The fate of the very poorest now crucially depends on how willing the world's community is to provide a global safety net.

1. Academy of Management annual meeting, August 2007
2. http://www.outsights.co.uk/ See: Scenarios for the Poorest, Outsights Multi-Stakeholder Project, 2004

Work & business

How will the changing nature of business and work affect the type of employee development required?

W1. Big business

After a decade of unprecedented cross-country mergers, acquisitions and consolidation in many sectors, 2020 sees big companies growing even bigger. There may be less of them but they are monster-sized, dwarfing the GDP of most countries.

Economic governance has changed fundamentally away from the pursuit of profit maximisation and shareholder value. Customer actions over the last decade have forced big business to self-regulate[1]. It is now taken for granted that consumers demand ethical and environmental business practices from large companies, and this in part has contributed to the vertical integration of supply chains as companies seek to limit the risk of poor ethical practice damaging their brands.

Technology now allows all businesses to continually refine and individualise their B2C (business to customer), B2E (business to employee) and B2S (business to shareholder) relationships. For big companies, as part of their employee relationships, this means increasingly taking responsibility for employee health, well-being and work/life balance.

As the fight to keep their top talent gets ever more intense, in 2020 the concept of the corporate career or job-for-life is back. After the breakdown of psychological contracts between employers and employees in the 1980s following impact on big companies of early global competition and downsizing, it was thought that the implied social contract of lifelong employment in return for employee commitment and loyalty was dead. Not so. Unlike in the 1950s, however, the new contracts are for the privileged few identified at aged 18 for the 'top-talent pool'. With company provision of housing and health services and comprehensive in-house learning and development opportunities, companies seek to make it only for the very brave or foolhardy to consider walking out of the door. Who else but top talent gets a nice house anymore.

In contrast to the outsourcing of support services in the 1990s-2000s, since 2020 we have seen these services become in-sourced, including training. Responsibility for further educations and skill development rests with the business[2] which tends to provide it from its own large internal corporate universities and training infrastructures.

Virtual social networks across operations and client base appeal to the millennial generation (those who entered the workforce after 2000). Now in 2020 the millennial generation are mid-career and comfortable with using technology to interact with training, government and work.

1. Managing tomorrow's people : the future of work to 2020, Price Waterhouse Coopers, 2007 http://www.pwc.co.uk/pdf/managing_tomorrows.pdf
2. Outsights on the global economy: non-economic drivers, http://www.outsights.co.uk

W2. Small businesses

Small businesses have greatly grown in number in recent years and now employ over half of the private sector workers in the developed world. Since 2010 they have also been responsible for creating roughly 75 percent of new private sector jobs[1].

Small businesses compete in two main ways. First are those that continue to supply local markets especially in food retailing and personal services. However, the real growth has been in the second category, with highly trained and highly prized specialists using their creativity and agility in new industries and new markets[2]. Often they join together using technology to collaborate in networks to compete against big business.

Many commentators attribute this growth to the digital infrastructure grown since the 1990s which has reduced the costs of starting and running a small business, at the same time as opening up the global markets to small businesses.

The marketplace is complex, requiring an increasingly sophisticated set of management skills for small business people. Responsibility for skill development in these small businesses rests with individuals who source it from the external market or from the increasing number of professional guilds.

The face of entrepreneurs has changed dramatically in the last 20 years and we now have the most diverse pool of entrepreneurs ever:

- Baby Boomers (now aged 56-74) are the most well known group starting their own businesses using access to capital from housing equity, broad job skills and extensive personal networks. These are the not-for-retiring sort who see creating their own business as a more flexible work environment than corporate jobs used to give them.
- Mid-career women who since 1995 have increasingly seen their own business as an alternative to being held back by glass ceilings and unequal access to the top in big business.
- Immigrants bring education and experience and a developed network/contacts from their country of origin. The bi-lingual, bi-cultural approach is ideal for creating businesses that link markets and enable businesses to be both global and local, and to source materials and goods in one market to sell in another.

Entrepreneurship used to be seen as something one learned only through experience and mentoring. The growth and success of entrepreneurial courses has changed this view.

1. Intuit Future of Small Business Report, 2007, http://www.iftf.org
2. Outsights on the global economy: non-economic drivers, 2005 http://www.outsights.co.uk

W3. Flexible working

In 2020 men have overtaken women in terms of numbers working flexibly for the first time. Early in the 21st century when the right to request flexible working was first introduced in the UK (initially just for workers with children under the age of six), the spotlight was on working women coming forward to request part-time or term time only working[1]. The right to request was constantly extended piecemeal until now it covers most workers. One third of men now work flexi-time or compressed working hours.

Flexi-time is now especially common amongst white collar and professional men. The recent growth has been among those working in large workplaces and in the banking, insurance and finance industries. Of all the flexible working methods, it was flexi-time which got the biggest boost from the 2012 London Olympics, especially among London and home counties based employers. Often introduced as a temporary measure to limit any potential productivity drop from employee absence to watch events or soaking up the atmosphere, companies enjoyed such employee engagement, commitment and team-working gains with no overall loss in productivity that they made their flexi-time schemes permanent.

Compressed working hours, meanwhile, has sparked a revolution in large manufacturing and construction companies with one in five men now working full-time hours over four days rather than five.

Government legislation has allowed workers in their late 30s to arrange flexibility – of career development as well as working hours – when they have children. They generally opt to work from home to provide this flexibility during times that fit best around family care. Young people are also more demanding – and even new graduates want flexible working at the beginning of their career.

Valuable Baby Boomers, working well into their 70s, are demanding – and getting – the ability to flex paid work around their various other responsibilities and home lives.

Environmental concerns over employees commuting to work and the opening up of global markets have taken over from the cost of office space as the prime drivers fuelling a continuing steady rise in homeworking[2]. Some organisational cultures have struggled to cope since the early 1990s with the need to manage homeworkers on output-based objectives. Although this is still a problem for managers in some companies, on-line reporting systems are helping curb the view of homeworkers as shirkers. Company social networking sites are also making it easier for homeworkers to 'feel' part of a team and to identify more with the wider organisation.

1. Hooker H, Neathey F, Casebourne J, Munro M (2006) The Third Annual Work-Life Balance Employee Survey Main Findings, DTI Employment Relations Research Series No 58: UK
2. Future Work Forum, Managing Tomorrow's Workers, Henley Management College, 2007.

W4. Moofers (Mobile out of office workers)

New technology has made it more practical than ever before to live a business life in nomadic fashion[1]. And thanks to fast, multi-megabit broadband speeds on mobile phones and free wi-fi networks with almost universal coverage in the developed world, being a mobile out of the office worker has never been easier.

Moofing is a loose acronym which was first popularised back in 2007 based on the term 'mobile out of the office'. It describes someone who is working from a location best suited to the task in hand whether that be in the office, at home or usually in another location. Companies who employ moofers understand that work is something you do not somewhere you go[2].

From a trickle in the early 2000s, the earliest out of office workers were noticeable tapping into their big laptops in the corner of coffee shops, hotel lobbies and airport lounges or wherever a wi-fi connection could be found. Many were 'in between' sales meetings or making use of dead time when they were away from their offices. Now the new generation qualify as moofers because they have broken away free from desks and work on the move, mobile from choice.

Today's moofers, in 2020, probably do still have an office space. Of sorts. Somewhere. Although they may not visit often. They conduct deals, hold meetings and find inspiration anywhere they happen to be. Many restaurants and clubs have diversified with designated meeting rooms and back-office services so moofers can make best use of occasional pitstops throughout the day or night, recharging equipment and themselves. Not to mention printing out the documents for the next meeting.

Moofing is not linked to a particular sector or business type. Some are entrepreneurs running their own technology-based companies. Some are small business workers or freelance workers like journalists. Others work for big business with professional or managerial roles who need to travel to meet clients and collaborators. Plus, someone has to go round and motivate all those homeworkers once in a while!

Office-based big business colleagues used to be wary (and on occasion even jealous) of their moofing colleagues and needed reminding that out of sight is not out of mind – they can always be contacted if you need them. But now those colleagues benefit from other types of flexible working themselves in-office *vs* out-of-office worker relationships have improved.

1. http://technology.timesonline.co.uk/tol/news/tech_and_web/article3016053.ece
2. http://www. personneltoday.com/blogs/workplace advice/2007/11/flexible working

W5. Leadership and management

The leading edge successful organisations of 2020 that excel in performance also ensure the well-being of their employees. These companies pay attention to collaboration, creative adaptation, customer integration, cultural inclusion and managing knowledge[1]. They don't so much adapt to change (as their forerunners in the 20th century did) they create the change themselves.

For leaders at every level the key challenge is mustering and fostering resources from inside and outside the organisations to support this creative adaptation. Their key tasks are to:

- anticipate, embrace and proactively respond to whatever changes are necessary for exceptional performance
- set the tone for a collaborate approach to workplace practices, teamwork, collaborative learning and cross-functional or cross-company integration
- ensure fast almost fluid grouping together with other providers or companies in partnership working arrangements to meet changing consumer demands.

Leaders in the fast changing world of 2020 need less business sector knowledge than they used to. Remember the music industry back in the mid-2000s? When the music industry fundamentally changed in nature, what good was knowledge of the former music industry? To lead the likes of the now defunct EMI in 2007 the CEO would have been better as someone with the skills to reframe uncertainty and a broker of resources to shift the company in a new direction.

Businesses are continuing to embed sustainability in their governance structures[2], for example, with board-level sustainability expertise and environmental performance targets for CEOs. Many have designated environmental members – a government requirement for mining and timber – and annual sustainability ratings are regularly being used as a benchmark for awarding government contracts. So it helps if leaders care not just about their customers and the well being of their employees, it is essential to care about the environment too.

Management of virtual teams has created new challenges. Developing empathetic relationships is key[3].

1. William A Guillory, The FuturePerfect Organisation – leadership for the 21st century Industrial and Commercial Training Vol 39 No 2 2007 www.emeraldinsight.com
2. Navigating effective sustainable development partnerships, International Business Leaders Forum, 2005
3. A guide to developing enlightened leadership: 26 lessons from A to Z, Roffey Park http://www.roffypark.com

W6. Worker expectations

Today's workers expect a real say in company policy and organisations have been forced to comply. Wikis with chat messaging options are the norm for active employee debate about the company. When young workers perceive they are being treated unfairly, they will demonstrate their talent for organising. Across Europe, they are beginning to revitalise the trade union movement as a pan-European force. The USA too, is seeing the re-emergence of trade unions as a way to lobby an organisation about pay, benefits and working conditions.

The young Gen Xers of several years ago would typically quit and move on when they had a workplace problem. Millennials, on the other hand, are used to staying put and waiting until someone in charge solves the problem. Their values are swinging away from those of Gen Xers, as younger workers are putting a higher premium on job security. Employers are once again finding it easier to cultivate loyalty in a generation with unusually long time horizons[1].

Life and work have been overlapping and interacting more and more since the 1980s. Society has been recognising over-work as a primary cause of growing ill health, both physical and mental, for some time. The 20th century's emphasis on salvation through paid work is known to have had an adverse effect on the quality of the rest of a person's life. But in 2014, the UK government passed new working time legislation. This introduced the kind of legally enforceable individual and collective rights at work enjoyed by our mainland European neighbours since the late 1990s[2].

Today's entrepreneurs expect to work with other like-minded individuals rather than alone as they often did in the past. Co-working facilities – café-like collaboration and community spaces – are now available in many US and European cities, charging by the hour, day, week or month. San Francisco's 'Hat Factory' (*http://hatfactory.net*) has become a common model, providing training programmes as well as traditional office facilities.

The need for flexibility has shifted the way dual-income families expect to organise their careers. The corporate/small office-home office (SOHO) hybrid family generally has one member working in a relatively secure corporate job with access to benefits, especially healthcare. This allows another family member to start a more risky personal business – sometimes so successful the corporate partner joins in[3].

People have had to accept the high likelihood they will need to study for their next occupation, even as they pursue their current career. Career changes have become increasingly frequent as jobs, roles, organisations, and even sectors, change and merge. In two-earner couples, one now commonly takes a sabbatical to prepare for a new career[4].

1. Managing for the long term. Neil Howe and William Strauss, Harvard Business Review, July-August 2007
2. http://www.esrc.ac.uk/ESRCInfoCentre/Images/fow_publication_2_tcm6-6060.pdf
3. Intuit Small Business Future Report, 2007
4. 53 Trends Now Shaping the Future, World Future Society, 2005

W7. Types of jobs

In 2020, 46 percent of the UK workforce is in a professional level occupation[1] - up from 30 percent in 1980 and 41 percent in 2004.

Some jobs we are less likely to do than we might have done 12 years ago in 2008. A job in manufacturing for instance has become more unusual as the sector finally bottoms out reaching its lowest level since the early days of industrialisation. Even though the widespread policy of off-shoring call centres first to India and then South Africa was reversed by many companies in the late 2000s, jobs in UK call centres have still decreased overall as companies downsize their call centre capability as they expand their web-enabled customer services.

The job levels in retail have remained pretty much the same since the 2000s. Despite grim predictions that the fall in prices of goods as production switched to China and the so-called 'credit crunch' would mean major job losses. As we know the retail sector held up well – because demand for goods increased. Jobs in leisure, personal services and care services have also slightly increased – as the country gets richer we can afford to spend on these.

So what jobs are we more likely to be doing these days? What do these extra professional level jobs actually look like? Despite ministerial forecasts in 2007[2] that we would all be working in science, innovation and research, our jobs are called, well, pretty much what they would have been back then. The big difference is in the technology we all use to do our jobs. That's where the real changes have been. We are doing similar things but in a much, much more technologically intensive way.

Our on-going training is focused on making use of each new wave of technology. Take the case of plasterers. Until the mid-2000s, most plaster was mixed up by a labourer in a 'bath' or bucket. It was then shovelled onto a board and smoothed onto the surface by hand using a 'hawk' and 'float'. Yes, really it was! Now we take it for granted that the plaster is mixed by machine and sprayed onto the wall where it is smoothed off. A plasterer is still called a plasterer – they just learned to use new the new spraying technology. S/he just takes an hour to do a room that used to take an entire day. The cost of plastering is much cheaper these days. But we don't have less plasterers. Why? Because it is cheaper, more people want plastering services.

Similar changes in technology in other jobs and sectors have enabled us to compete in global markets more effectively. That's where the extra higher level jobs have come. So we have more teachers and lecturers but they are teaching non-UK populations. Similarly designers, eco-architects and computer games programmers are doing business for non-UK clients. Unlike in previous generations they do it from the UK using technology.

1. Leitch Review of Skills, Prosperity for all in the global economy – world class skills, 2006
2. Minister for Skills David Lammy, Keynote speech to IES Annual Public Employment Policy Conference, 6 November 2007

Brain & mind

How will developments in neuroscience, psychology and adult education influence how people learn?

B1. Informal learning

Learning managers have long since known that informal learning accounts for more than 75 percent of the learning taking place in organisations[1]. Both planned and spontaneous informal learning occurs in collaborative and individual settings: on-the-job learning, discussions with colleagues, industry conferences, reading, surfing the web, and so on. On-the-job learning, rather than formal training sessions or reading company manuals, is recognised as the way people learn the tricks of their trade. Therefore, people with experience and insights are highly networked to support their co-workers.

Since 2010, organisations have been re-thinking how employees learn by fostering more routine collaboration, embracing network technology and opening up learning opportunities – not only for employees, but also for customers, partners, suppliers and many other stakeholders. As a result of new initiatives, facilities teams are working with learning managers to ensure well-designed workplaces enhance the opportunities for informal learning.

Communications systems continue evolving to enable faster and easier knowledge share. In contrast to earlier times, IT professionals better appreciate how knowledge emerges and is sustained in a social context. By understanding people as well as technology, they are helping to systematise informal learning within the corporate environment. Social networking tools such as wikis, blogs, social tagging and virtual meeting rooms are all commonly available. Organisations are actively promoting virtual communities of practice to increase informal learning and knowledge share.

The multi-disciplinary give-and-take that characterises innovative problem solving has become accepted practice in the development of high-performance teams. In these communities, learning through active participation, rather than passive knowledge acquisition, is the primary way people master skills and knowledge to become competent team members[2].

In terms of the built environment, new office spaces, research facilities and production environments are being designed with many small informal meeting areas, often incorporating a mini-street with coffee bars. This trend follows the example set by British Airways[3] and others in the late 1990s.

Five design factors[2] are fostering informal learning:

- eco-diversity: more varied work settings inside and outside the 'office'
- spatial transparency: more opportunities for employees to observe the behaviour of each other at work
- neutral zones: more deliberate planning, design, and use of spaces not owned by any particular discipline or unit
- human scale: smaller scale work areas with less separation from related functional areas
- functional inconvenience: designing space to increase the opportunity for chance encounters

Learning has shifted from training workers to facilitating knowledge acquisition, while an 'always-on' informal learning environment is more responsive to the rapidly changing needs of a networked world.

1. http://www.protonmedia.com
2. California Management Review Vol 49, 2, Winter 2007 http://informl.com/ Jay Cross informal learning blog http://www.niit.com/niit/ContentAdmin/MED/MED9/6.htm Informal computer-based learning in an Indian village Financial Times 07/01
3. http://findarticles.com/p/articles/mi_m3575/is_n1218_v204/ai_21119081 10/98

B2. Implants

Brain implants[1] are beginning to move beyond those initially designed to circumvent dysfunctional brain areas after a stroke or head injury. Many implantable and stimulatory brain devices are routinely available to block hunger signals and combat obesity, tackle Parkinson's disease or relieve chronic pain[2]. Second generation implants are creating interfaces between the brain's neural system and computer chips. Older interfaces between brain and machine have been in use for many years in technologies such as electroencephalography to measure brain waves.

Unless treating a medical condition, most people still prefer to use head electrodes rather than full brain implants. These electrodes enable the individual to connect with a computer through a process known as 'datajacking' to create simulated stimulation. This means the individual experiences another reality directly and industry has begun to use this concept to enhance learning.

These applications have been developed from the entertainment industry where people 'datajack' to join cyberspace parties, plays and films. Most learning applications, however, are based on augmented reality – a combination of real world and computer-generated data, rather than a completely fictional environment.

The Pentagon's Defence Advanced Research Projects Agency developed RoboRat[3] in the late 1990s. In this programme, operators remotely controlled a rat's movements via electrodes implanted in its head. Pentagon researchers are now developing a human project, saying this work will eventually enable the military to defuse terrorist actions and make soldiers more effective warriors.

Advances in nanotechnology are enabling medical staff to infiltrate intact brains with a network of cell-sized machines (nanobots) to read the structure and activity of the brain in situ. For medical purposes, this allows artificial nanobot neurons[4] to replace living neurons while the subject is still conscious, providing a smooth transition from organic material to the living brain.

Brain implants are well-established in the field of medicine, but researchers are developing neural nanobot applications for the world of work. One MIT programme is investigating the use of computer-interfaced nanobots for call centre use. In this initiative, call centre staff can answer a customer's call by directing a thought to the computer, which opens the correct screen without the use of a mouse. The central system logs staff reactions to customer calls and checks them for accuracy.

Following Microsoft's earlier success of the so-called 'Big Brother' software[5], companies routinely run remote checks on workers by monitoring their productivity, competence and physical condition. Since the demise of trade unions in around 2015, union voices speaking against this development have been overruled in several corporations.

However, companies have run online chat forums to assess the system's acceptability by workers. While many view this as a negative move, most can see the benefits. Wireless sensors, linked to a central computer, measure individual metabolism and can provide an early warning of medical conditions ranging from stress and early heart disease to liver and kidney problems.

CEO, Mary Smith, of the global conglomerate Nano Products Corporation, recently said: 'Introducing the "Concerned Sibling" system has been expensive, but our staff are pleased we have such a concern for their well-being.'

1. http://www.technology.gov/Speeches/RC_060719.htm 07/06
2. http://www.newscientist.com/channel/being-human/mg19526181.300-your-body-the-powerplant.html New Scientist 08/07
3. http://www.newscientist.com/channel/opinion/mg19325871.900-review-mind-wars-by-jonathan-moreno.html New Scientist 01/07
4. http://www.youtube.com/watch?v=R-2Xw-GNkUQ
5. http://technology.timesonline.co.uk/tol/news/tech_and_web/article3193480.ece 01/08

B3. Positive psychology

In 2020, it is now more than twenty years since Martin Seligman[1] popularised the term 'positive psychology' – and more than ten since *Harvard Business Review* identified it as a breakthrough idea[2]. The positive psychology approach has been incorporated as a core driver of organisational performance, engagement and well-being.

Positive psychology informs personal development programmes for people at all levels in many organisations. Its principles are being taught in schools to equip children with the psychological skills and capabilities to lead productive, happy lives. The science and research base that supports these approaches are now extensive and grounded, with a well-proven link to business performance. There is no longer any excuse for organisations to think positive psychology is 'soft and fluffy'.

The positive psychology approach turns on its head the previous notion of focusing development on personal weakness, poor performance and failure. Instead, it focuses more on what is right with people than what is wrong with them; what is working rather than what is failing. The key ideas organisations have adopted include those focusing on strengths[3], psychological capital[4] and the importance of positive emotions[5].

Performance management meetings routinely spend 80 percent of the available time on what people do well (their strengths). Meetings discuss how to build strengths further to become truly excellent and identify ways people can use them more effectively to achieve the organisation's goals.

Weaknesses are not ignored, but the performance focus is on how people can use their strengths to manage their weaknesses. As roles change rapidly and job descriptions become quickly outdated, building capability around people's strengths – and finding ways to use those strengths in new contexts – is ever more important.

The positive states of mind leading to high organisational performance and fulfilled employees are now well understood ('psychological capital'), as are the supporting tools and techniques. Chief among these positive states are confidence, hope, resilience and optimism, which all have clear links to business performance. Managers in leading organisations are particularly focused on how to help people develop these positive states of mind.

For years, people have recognised that happy workers are more productive, but organisations now genuinely believe it and routinely spend time to improve how staff are feeling. Happy people take less sickness absence, deal with periods of change better and are more creative and productive. A key skill of managers and leaders is to manage the mental states of their teams so that staff feel both happy and productive. Again, this is not just 'happy clappy', but grounded science that shows the real link to business performance.

1. http://www.authentichappiness.sas.upenn.edu/Default.aspx
2. Breakthrough ideas for 2007, Harvard Business Review
3. Now, discover your strengths (Marcus Buckingham and Donald Clifton, 2001).
4. Psychological Capital: Developing the Human Competitive Edge (Luthans, Youssef, Avolio, 2007)
5. Fredrickson, B. L. (2004). The broaden-and-build theory of positive emotions. The Royal Society, 359, 1367-1377

B4. Brain download

Programmes are available that enable individuals to share each others' experiences via a computer link – 'seeing' another person's experiences in your own mind's eye. Imagine sharing a friend's real time holiday experiences virtually – you would never need to get on an airplane again.

Test subjects at the research labs of the 'Total Recall Company' have reported tasting curry and touching a cat's fur being as real as if they were doing it themselves. Eventually, futurologists predict, external computer links will no longer be necessary to share experiences with another person. Instead, our brains will be installed with the necessary nanobots to create mind-sharing capabilities.

Supercomputers have been around since the turn of the millennium that simulate the human brain's power. But now it is possible to actually transfer a human mind to an artificial substrate, such as a detailed computer simulation of an individual's brain[1].

Researchers have been able to scan the brains of monkeys and, more recently humans, and 'download' them into a neural computer. Predictions suggest our carbon-based bodies will soon be obsolete: "You could run your virtual personality on a network of computers. It's going to be difficult to determine where one person ends and another person starts." [2]

Several new technologies, far beyond old integrated circuits, are being used to support brain downloading and mind transfer, such as optical neural networks based on the silicon-photonic chip[3], 3-dimensional computers based on carbon nanotubes[4] and the quantum computer[5], which facilitates the protein structure prediction critical to correctly emulating intracellular neural processes.

For terminally ill patients, researchers are having some success with mind uploading from their organic brain to an inorganic medium using cyborging[1]. In this technique neurons are replaced individually while the patient's consciousness remains intact. Once the brain is mapped, it is replaced piece-by-piece with nanobots performing the same function.

After substitution, the patient regains consciousness to validate their subjective experience of reality. At this point, their brain is immediately re-mapped and another piece replaced, until the personality exists on a purely hardware medium and the patient's mind can be safely extricated from their body.

In cases where the body has ceased to function, such as following severe trauma or disease, the patient is artificially resuscitated while the brain is placed in cryosleep in preparation for the brain download.

1. http://en.wikipedia.org/wiki/Mind_transfer
2. http://www.eetimes.com/special/special_issues/1998/timespeople98/kurzweil.html
3. http://topdawgtech.blogspot.com/2005/04/ride-light-silicon-photonic-chip.html
4. http://www.theregister.co.uk/2008/01/16/darkest_material/ 10/08
5. http://computer.howstuffworks.com/quantum-computer.htm

B5. Unconscious learning

NLP practitioners have joined forces with martial arts experts to produce new models for unconscious learning. For example, most people are familiar with 'unconsciously' learning to ride a bike. New techniques help experts guide novices to overcome the normal frustrations of the expert who cannot pass on their learning and the learner who cannot move beyond unconscious incompetence. Unconscious installation[1] comes about by accessing patterns of rules and guidelines in a trance-like state.

Unconscious learning is also supported by photoreading[2], a technique where the individual passively uses their peripheral vision to access their unconscious mind – as opposed to actively reading from the page. Photoreading is a modern form of speed reading that allows learners to absorb information from various media such as print, web pages and emails on subjects from business to leisure. The technique uses phenomenal speeds to blast information at the learner's brain as a mental photograph. Learners from technical backgrounds, in particular, say they would be unable to keep up with developments without quickly absorbing the masses of information regularly available.

By 2012, Professor Pierre Balthazard of Arizona State University had mapped the brains of 500 leaders by wiring electrodes to their scalps and recording electrical brain activity[3]. He had previously discovered that visionary leaders use their brains differently. Now leaders' brains are routinely mapped to demonstrate their visionary capabilities. Electrodes link them to a computer to stimulate specific areas of the brain responsible for unconscious thought and in this way, a leader is able to unconsciously enhance their visionary capabilities.

Learning design expressly combines well-known conscious learning techniques with newer practices that embody unconscious learning – previously an ill-defined concept, but now grounded in scientific method. Implicit learning[4] is better understood and proven learning techniques manage the process to make use of what was previously a random and chance learning outcome.

Even long, careful and conscious deliberation is ineffective because the conscious mind has a surprisingly limited processing capacity. Most people cannot, for example, compare three makes of car differing on 14 dimensions without brain overload. Experiments have shown that the more mental effort people put into decisions, the poorer the predictive outcome[5]. Conscious deliberation leads to sound decisions only when a very limited amount of information is involved.

Decision makers have learned not to think so hard about their decisions – to rely instead on the power of their unconscious mind, which has a far greater processing capacity than its conscious counterpart. They prefer to make a complex decision by 'sleeping on it' – occupying the conscious mind with an unrelated task mind while their unconscious mind processes the relevant information.

In the past, gut feeling, or intuition, was regarded as an undesirable attribute in a leader. Today, executive search companies commonly list 'instinctive decision making' as a desirable candidate quality.

1. http://www.transformations.net.nz/trancescript/how-to-be-consciously-unconsciously-skilled.html
2. http://www.photoreading.com/
3. Wall Street Journal Online, September 20, 2007
4. http://www.psychol.ucl.ac.uk/david.shanks/Implicit%20Learning%20review%20chapter.pdf
5. HBR breakthrough ideas for 2007

B6. Smart drugs

Smart drugs, or, nootropics[1] – drugs that enhance the brain's capabilities – work by increasing the brain's supply of neurochemicals (neurotransmitters, enzymes, and hormones), improving the brain's oxygen supply, or by stimulating nerve growth.

Scientists have developed several smart drugs, some completely original and others a refinement of previous products. Today's smart drugs come without the traditional side effect of addiction. However, brain capacity-enhancing drugs are not new. People have needed to start their day with a sharpening fix of caffeine or nicotine for hundreds of years.

Brain-enhancing drugs developed originally to treat diseases such as Alzheimer's, are increasingly used among business executives to improve their perception, memory, planning and judgment. A development of Ritalin, originally prescribed to children with attention deficit hyperactivity disorder, is routinely used by people to enhance their mental performance.

Modafinil has been further refined from its original use to treat narcolepsy, reduce impulsiveness and improve focus[2]. A new drug, Modafinil™, enhances the brain's complex problem-solving capabilities by increasing an individual's reflective abilities. Problem-solving takes longer, but gives better results.

The original Modafinil was routinely administered to military personnel to keep them awake and alert. Modafinil™ is now taken by people needing to work erratic hours – time-shifting to collaborate globally, for example. The new drug produces effects similar to cocaine, but without the problem of addiction. Propranolol™, a beta-blocker previously used to treat patients with high blood pressure, is now regularly calming the nerves of those in stressful situations.

As well as enhancing the brain's capabilities, drugs have also been developed to delete specific memories[2]. These are proving particularly useful in situations where an individual needs to 'unlearn' a technique in preparation for new ways of working. The UK government is exploring the possibility of dispensing these drugs to the long-term unemployed to help the acquisition of new skills replacing outmoded learning.

But such intellect-sharpening, empathy-enhancing and personality-enriching drugs are likely to become only stopgaps[3]. Researchers predict that intellect may one day be genetically pre-programmed, while memory-boosting gene therapies already exist.

Many people do not wish to rely on the use of drugs to enhance their brain's functioning. Instead, they prefer natural means. Nuts, in particular walnuts, are rich sources of brain-enhancing alpha-linolenic acid, a type of omega-3 fatty acid as is oily fish such as salmon or fresh tuna. Other natural substances have been added to this well-known list and such foods are widely promoted in works canteens, vending machines and supermarkets.

1. http://www.erowid.org/smarts/
2. http://www.guardian.co.uk/medicine/story/0,11381,1528069,00.html
3. http://nootropics.com/

B7. Accelerating learning

Most employees have reported 'no time for learning' at some stage in their career, but what was once seen as an excuse is now recognised as a very real problem. One manifestation is known as 'continuous partial attention'[1,2] – the constant and addictive checking of handheld electronic devices. This behaviour is not the same as multi-tasking, where people aim to be more productive by simultaneously surfing the web while eating breakfast, for example. Multi-tasking requires little cognitive processing because tasks are fairly automatic.

Continuous partial attention, on the other hand, involves constantly scanning for opportunities to keep up with contacts, events, and activities. Endless bandwidth – unmatched by personal bandwidth – provided by mobile communications and increased computing power is amplifying these pressures.

The earlier Hewlett-Packard[2] , findings are confirmed – those who constantly deal with a barrage of messages at work experience a temporary ten-point drop in IQ over a 24-hour period. The 'always-on' world is adding to the problems of sleep deprivation for interruption-driven executives whose potential for learning is severely compromised. The never-ending, ever-increasing stream of incoming data is leading to early burn out.

Companies are adopting the advice of industrial psychologists by providing staff with devices such as noise-cancelling headsets and personal stereos. These reduce information overload and enable more personal control.

Learning facilitators are working with building managers and IT staff to provide dedicated floor spaces and virtual environments for meditation such as yoga and Tai Chi. These classes have been found to accelerate the learning process by 'readying the mind and calming the spirit'.

Learning opportunities reflect earlier accelerated learning[3] theories. Current provision uses whole brain learning – not just analytical thought – to employ the subconscious mind. Learning sessions take place in positive learning environments incorporating the use of music, visual art and drama. Sessions typically create space for reflection and meaningful dialogue, providing much-needed spiritual peace and time to think.

Coaching is an accepted accompaniment to learning either in person or virtually. Studies showing productivity increases from 28 percent without coaching to 88 percent with coaching. Coaching accelerates the incorporation of new knowledge following an energising learning insight – central to facilitating personal change.

Sudden bursts of high-frequency brain oscillations appear just before an insight, which help create complex new connections across parts of the brain[4]. By conducting regular coaching sessions, these new connections become hardwired, enhancing an individual's mental resources to overcome the brain's resistance to change.

Companies are adopting the advice of researchers who have proved that the built environment affects learning. Suggestions include[5]:

- link the indoors and outdoors to promote movement and oxygenate the brain's cortex
- vary spaces to provide multiple areas with different shapes, colour, light, nooks and crannies
- regularly change the environment, for example, new displays and stage constructions to create an interaction with the environment that stimulates learning
- keep learning resources handy for rapid development and cross-fertilization of ideas
- create active and passive places – places for reflection and retreat as well as active interpersonal engagement
- recognise personal space – express identity by personalising space and having places to express territorial behaviour.

Companies are re-thinking their employee brand to portray an attractive work culture that offers more discriminating choices and better quality of life. These companies are contributing to life-long learning from an understanding of how an individual learns rather than what they should be learning.

1. http://continuouspartialattention.jot.com/WikiHome
2. HBR breakthrough ideas for 2007
3. http://www.newhorizons.org/strategies/accelerated/deporter.htm
4. The neuroscience of leadership: Rock, D. and Schwartz, J. Strategy and Business Issue 43, Summer 2006
5. www.ets.org/Media/Campaign/2306/pdf/BrainCompatibleLearningEnvironments.pdf

B8. Memory retention

Sleep deprivation is well known to hamper the retention of learning after studying, but research has shown the importance of sleeping well before studying[1]. People who fail to get a good night's sleep remember less than well-rested individuals. Earlier sleep studies have been confirmed by using a wider cohort of subjects and the business world is taking note.

Companies have come to openly acknowledge the importance of sleep – not just to learning but in everyday work tasks – following a number of successful law suits. These include accidents involving sleep-deprived employees or stress-related claims for damages against employers. As a result, daily brain scanning has become an important part of every company's well-being programme.

Sleep deprivation diminishes activity in the hippocampus, a brain region involved in memory processing. Too little sleep increases levels of stress hormone in the brain, which subsequently disrupts hippocampus nerve activity.

Sleep is a natural way to improve memory retention, as is learning design. Given the small capacity of working memory, many small bites of learning digested over time are known to be more efficient than large blocks of time spent in workshops[2]. Computer-aided 'micro-learning' has been commonly adopted, particularly for skills upgrades.

But artificial means to improve memory are also available. While the overall number of brain cells decreases as people age, new cells are generated in at least two areas of the brain throughout adulthood[3].

Ten years ago, researchers discovered these cells are involved in the formation of new memories. More recently, neural nanobot developments have created ways to stimulate growth in these new brain cells. Recent nanobot initiatives are contributing to an improved retention of new knowledge and higher levels of information processing.

The newly generated cells modify existing neural circuits to incorporate and retain new information. Clinical trials have found these cells help older cells adapt to new conditions, such as the loss of neurons through disease.

In addition to neural nanobots, new drugs are available to improve memory. Scientists have learnt that memories may be gone but not forgotten. Memory loss is often due to the inability to retrieve memories rather than memories having been irretrievably lost.

Rather than stimulating brain cell growth, these drugs restore lost memories by triggering the natural 'rewiring' between brain cells[4]. Until recently these drugs were only used to treat the neurodegenerative diseases associated with impaired learning and memory loss such as dementia. But non-prescription drugs are now available to learners in business and education settings.

1. http://www.newscientist.com/channel/being-human/dn11154-sleep-well-before-learning-something-new-.html New Scientist 02/07

2. The neuroscience of leadership: Rock, D. and Schwartz, J. Strategy and Business Issue 43, Summer 2006

3. http://www.newscientist.com/channel/health/dn11916-adultformed-brain-cells-important-for-memory.html New Scientist 05/07

4. http://www.newscientist.com/channel/health/dn11739-lost-memories-could-be-restored-by-rewiring-brain.html New Scientist 04/07

B9. Cognitive fitness

The UK government has recently announced an increase in the retirement age. This change has come about due to the increasing cost of pension provision and reduction of young people entering the workforce. Added to this, many people over the age of 65 are fit enough to work and wish to continue, albeit in a part-time capacity.

In spite of the widespread belief that mental capabilities inevitably deteriorate as we age, some people over 60 still demonstrate keen mental facilities. As a result of earlier scientific findings, many individuals know how to maintain their cognitive fitness – the ability to reason, remember, learn, plan, and adapt.

By adopting the earlier theories of Gilkey and Kilts[1], executives are practicing specific techniques to stimulate development of new brain cells and neural networks.

1. Use indirect experiences such as observation or simulations
Most people recognise that direct experience is key to enhancing mental capacity. But Gilkey and Kilts explained that the brain has specialised nerve cells enabling a person to form new neural networks through indirect experiences. Observation, simulations and case studies, for example, accelerate learning and present fresh perspectives that enhance informed decision making.

2. Engage in play
Play engages the prefrontal cortex, responsible for high-level cognitive functions such as memory and mental imagery. But people need to take part in activities that involve risk because it alerts the brain and activates reasoning and imagination capacities. Companies support bridge, chess and Sudoku championships, which all provide rigorous neural workouts.

3. Search for patterns in seemingly unrelated fields of endeavour
Executives are encouraged to improve their pattern recognition by expanding their mindset, for example, visiting new places and listening to different viewpoints.

4. Seek novel experiences
Because novel experiences stimulate the brain to generate the new knowledge needed for pattern recognition, companies support executives in challenging activities such as learning a new language, painting or taking lessons on a musical instrument they have never played before.

Companies have adopted new practices in line with these research findings to enhance employee cognitive fitness. Organisations are promoting 'brain-positive' cultures by encouraging employees to individually apply these four brain fitness practices.

1. Cognitive fitness, Gilkey and Kilts, Harvard Business Review November, 2007

B10. Adaptive learning

It has been more than 30 years since Peter Senge[1] became famous for his seminal work on learning organisations. But as learning managers are only too well aware, organisations as a whole do not learn unless individuals do. While 'organisational learning'[2] was much debated by learning professionals in the late 1990s, it never really engaged business leaders. However, the continued drive to improve knowledge management across organisations is a practical application of organisational learning readily grasped by leaders.

Until recently, knowledge management has suffered from being overly technology focused, losing its humanity and the key role it plays in organisational learning. In addition, while complexity theory was buzzing among learning professionals in the 1990s, it never moved far from being a fascinating solution looking for a difficult problem.

Now, complexity theory has found a practical application in its explanation of how living systems engage in adaptive learning – enter the learning organisation in action. This means organisations and individuals can benefit from a vital source of knowledge. Today's learning managers have brought together the thinking and practice behind knowledge management, organisational learning and complexity theory to produce workable models for continuous learning and growth.

Information systems practitioners and learning advisers are routinely collaborating to bring an effective convergence of the hard end of knowledge management – information systems – and the human elements of an adaptive learning system, or true learning organisation.

Today's intensive knowledge economy requires constant learning of far more than just basic skills. These higher order skills are more effectively developed in the collaborative problem-solving, but uncertain, world of adaptive learning. Such learning often gives better results than a formal classroom with its inevitable emphasis on abstract tasks.

Previously, company learning budgets were continuing to spiral upwards. Harnessing the power of information systems and mobile communications to an understanding of adaptive learning is giving organisations a way to keep costs in check. Adaptive learning to solve problems, share knowledge – and create new knowledge – in an unpredictable environment is a normal expectation of each day's work.

A further, related shift is taking place. The business world up until 2000 had been dominated by logical, left brain thinkers with a narrowly reductive and deeply analytical approach. Since 2010, a radical shift has occurred. The CEO's office now belongs to a different type of thinker – a creative empathiser, pattern recogniser and meaning maker. Increasingly, artistic and 'feeling' individuals – storytellers, not accountants – are leading today's corporations.

Today's leaders understand the subtleties of organisational interactions, while also detecting patterns and seeing the opportunities within them. Leadership development in turn now accommodates 'complex ways of being' by building on Dan Pink's 'six senses'[3]: design, story, symphony, empathy, play and meaning. These are often combined with expanding other senses such as smell, touch and auditory capabilities – through musical stimulation and directed meditation, for example.

1. http://www.infed.org/thinkers/senge.htm
2. http://www.solonline.org/res/wp/learning_sys.html
3. *A Whole New Mind, Pink, D 2006*

Technology

How will new technologies, communications and social networks support people's development?

T1. Web trends

The web continues to be a vital part of organisational, personal and educational life as well as society in general – at local, regional and global levels. Trends include[1]:

- web participation costs continue to reduce – processing, bandwidth, storage and memory are cheap
- expertise barriers to putting content on the web have vanished
- a large 'gift economy' means knowledge workers freely contribute via the web, for example, open source development, Wikipedia.

The web has continued to develop a tremendous structure from its millions of cross-linkages – Google's pages, for example. Conversely, most intranets still do not have that same kind of cross-linking and have become radically less effective than the external web. Most companies have shifted web-enabled collaborative working externally, rather than rely on a sub-optimal intranet for all but simple use.

Externally, data-processing semantic web developments[2] are already harnessing and managing vast amounts of online information to help users collaborate and manage data more effectively. The semantic web is an evolution of the world wide web where software agents read and use content.

Imagine being able to find, share and integrate information easily – and in a way that reduces the problem of information overload. To achieve this, the semantic web continues to combine design principles and a variety of enabling technologies with a collaborative philosophy.

Semantic web-enabled online services[3,4,5] intelligently help users share and organise information with people they trust. This means users can collaborate globally around common interests, activities and goals.

These services assist users by tying together emails, bookmarks, documents, contacts, photos, videos, product information, data records, and so on.

Systems underpinning these services understand the meaning of a user's information and help them organise it automatically by recognising interests and relationships. In the move to greater collaboration, not just with colleagues, but globally with people never met before, semantic web services help users find – and be found by – the 'right' individuals.

For better personal organisation, imagine the benefit of being able to annotate information semantically. For example, highlighting the names of people or companies mentioned in an email and grouping them automatically into categories. This approach allows users to explore connections between different documents and see their information organised in a more insightful way.

1. Sloan Review - Future of the Web, Spring 2007
2. http://www.altova.com/semantic_web.html
3. http://www.twine.com/about
4. http://technology.newscientist.com/channel/tech/dn12903-semantic-website-promises-to-organise-your-life.html New Scientist 11/07
5. http://www.semanticweb.com/article.php/12160_3717146_1 12/07

T2. E-learning trends

In 2020, e-learning is an accepted and commonplace way to learn and has become as ubiquitous as email or search engines at the turn of the century. Trends include[1]:

- e-learning has levelled the world's professional playing fields
- governments are using e-learning for citizen skill development
- partnering organisations are using e-learning to keep people aligned as boundaries change
- wireless technology has enabled further reach, for example, to connect rural areas.

Churning skill sets have forced e-learning initiatives to keep up with organisational needs[1] and users are constantly accessing on-demand learning via their desktop – generally micro-learning rather than complete course packages.

Today's users regard self-selected, self-paced e-learning as an integrated work process, rather than something separate and specialised.

Companies have integrated e-learning into their infrastructure[1] and the term 'e-learning' has disappeared now it is routinely merged with work processes. This trend has coincided with the rise of social computing across, and between, organisations that makes e-learning an integral part of personal networking.

As a result, knowledge sharing and collaboration naturally benefit from the various supporting technologies. These are enabling e-learning to emulate the traditional face-to-face learning-by-storytelling process[1].

Leaders are acknowledging e-learning's important role in knowledge share and have observed a rise in innovation following informal learning. Many individuals are regularly contributing to e-learning processes by combining data from more than one source (technology mashup[2]) to create new and distinct learning environments.

More turnkey solutions are appearing as e-learning processes becomes standardised[1] and e-learning is no longer the preserve of specialist content providers. At the same time, high-quality content costs are falling due to a high-global student/content ratio[1]. E-learning processes are interactively publishing information 24/7 to facilitate continuous learning on demand[3].

Processes and authoring for e-learning have become simpler[4], while at the same time incorporating semantic web services and serious games. These combined approaches are delivering effective learning packages that often incorporate several supporting systems. This means a fully integrated desk top front-end that supports a user's learning no matter what their technology.

E-learning is easily provided remote from the user's organisation – and globally. Many companies are investing in technology that enables learners and tutors to communicate via online chat and web-enabled telephone services[5]. This development has helped several companies offshore[6] their online tutoring to other countries, notably India[7].

1. http://www.worldwidelearn.com/elearning-industry/trends.htm
2. http://en.wikipedia.org/wiki/Mashup_(web_application_hybrid)
3. http://www.nigelpaine.com *Nigel Paine, Learning Technologies Conference, 2008*
4. http://www-jime.open.ac.uk/2007/01/
5. http://www.usatoday.com/educate/college/firstyear/articles/20050904.htm *08/05*
6. http://www.learningcircuits.org/2005/nov2005/bersin.htm
7. http://www.careerlauncher.com/company/aboutcl/index.html

T3. Virtual worlds

Life is increasingly lived online, but not simply to email friends, family and colleagues or buy groceries, clothes and Christmas presents. People actually live online in virtual communities where residents socialise, participate in activities and trade between each other using avatars. Launched in 2003, Second Life [1,2] is an established example of an online virtual world.

Learning events in the virtual world mimic real life[3] – a pre-scheduled workshop or lecture, for example. Participants can contribute to conversations in the virtual corridor before the event and even indulge in side chat between each other during the proceedings. As well as formal learning with designated tutors and experts, virtual online communities are also supporting informal learning through special interest networks.

Interactive communities are not the only virtual world learning application. Participants can also learn within a standalone serious gaming environment – either individually or in a group, online or offline. Games provide a similarly engaging and interactive learning experience to virtual communities, but differ in that games are pre-programmed[4,5].

Organisations are purchasing off-the-shelf games or retaining a game's intellectual content. In the latter case, organisations are working with experienced designers who give the game an effective flow. The commercial sector and other organisations are increasingly taking over from the military[6] and schools[7] as the largest serious games users.

These serious games[8] are simulations with the look and feel of a game that are used in education, business and military operations. Gaming is recognised by industry and other sectors as an excellent platform for exploring and learning about complex issues, for example, a political situation, a multi-faceted marketing question or new product development.

But an individual does not need to be tied to their computer to go virtual. Imagine being a tourist. Instead of carrying a map, you wear a pair of spectacles[9]. As you stroll about, the lenses become semi-transparent monitors, feeding your eyes with information to help you learn about buildings and streets, maybe giving directions to a shoe shop or the nearest pizza parlour.

Some prefer this virtual reality over the fantasy of virtual worlds. In the spectacles example, what the user sees is an enhancement of the real world, not a completely fabricated environment. This head-up display application can be used to map objects, instructions or data onto what the user sees through their lenses – contact lenses, spectacles or a visor.

1. http://www.youtube.com/watch?v=b72CvvMuD6Q&feature=related
2. http://secondlife.com/
3. http://www.simteach.com/
4. http://www.thinkingworlds.com/
5. http://flux.futurelab.org.uk/2007/12/08/learning-for-games-or-games-for-learning/#more-135 1/07
6. http://news.bbc.co.uk/1/hi/technology/6059026.stm 10/06
7. http://www.thinkingworlds.com/
8. http://seriousgames.ning.com/
9. http://technology.newscientist.com/channel/tech/mg19526206.000-virtual-reality-will-enhance-realworld-experiences.html 09/07
http://www.nevillehobson.com/ Neville Hobson, technology guru and Second Lifer
http://www.worldofwarcraft.com/index.xml World of Warcraft, a popular online game
http://www.avantgame.com Jane McGonigal, gaming innovator
http://www.businessandgames.com/blog/2007/06/serious_games_bbc_first_tv_sho.html Business and gaming cross-over

T4. Telepresence

These days, people rarely travel more than an hour for face-to-face meetings, but telepresence with colleagues instead[1]. Telepresence enables user interaction with a real individual in a real, but remote location. This interaction differs from virtual presence, where the user conducts a meeting with an avatar in a simulated environment, such as Second Life.

Telepresence meeting members can see every other participant onscreen, giving the impression that everyone is present in the same room – even though they may be geographically separated by thousands of miles. Conversing as if they were actually present establishes an interpersonal bond between geographically separated group members. The technology[2,3,4] supports one-to-many or group-to-group meetings and is an improvement over 20th century videoconferencing – individuals onscreen appear life-size and without the old problems of lip-synch.

Interactions regularly take place via telepresence between individuals in meeting rooms or home environments. But the technology also enables people to interact face-to-face from difficult-to-access or hostile environments such as undersea oil exploration facilities, toxic production environments or high-altitude locations.[5]

Telepresence coaching has become widely available. People coach across the globe and are supported by online technologies such as virtual reality and e-learning. Routine telepresence co-coaching between individuals and learning groups is supporting continuous professional development in many fields such as teaching, medicine and law.

Holograms[6] regularly enter the business world. In the classic Star Wars scene, R2D2 projects a small holographic image of Princess Lea pleads for Obi-Wan's help to save the world. Imagine the princess is life size and in full colour. Appearing in high resolution, she is standing across the room from you – a holographic conference.

Human images appear sitting behind a desk, a lectern or even on a stage, giving the appearance that the person is sitting or standing there in real life[7]. Tele-immersion[8] transmits life-size, three-dimensional synthesised scenes and images over long distances.

On a smaller scale, individuals can view and work on a three-dimensional, full-colour holographic object through interactive imaging. For example, a medical student can use this technology to see a simulated full-size, three-dimensional beating heart. The student can then use virtual scalpels to perform heart surgery with the look and feel of actually performing the operation[9].

Holographic conferencing is re-energising 'action learning' by enabling participants to experience each other's worlds in real time without leaving their own environment.

1. http://www.youtube.com/watch?v=rcfNC_x0VvE
2. http://www.cisco.com/en/US/netsol/ns669/networking_solutions_solution_segment_home.html
3. http://www.eyeliner3d.com/musion_eyeliner_showreels.html
4. http://www.hp.com/halo/index.html?jumpid=re_r138/070828xb/Halo
5. http://techlogique.wordpress.com/2007/06/14/3d-holographic-hd-video-conferencing-dve-tele-immersion-room/
6. http://www.corbinball.com/articles/art-teleimmersion.htm
7. www.teleportec.com
8. www.advanced.org
9. www.3dmedia.com

T5. M-learning

Learning content is still sometimes distributed via traditional laptop download, but is increasingly delivered via mobile technology such as mobile phones, wireless laptops, palmtops and wearable PCs[1]. Users are routinely accessing learning content remotely and on the move – off-site and in the field – via devices similar to the old iPhone[3] or iPod[4,5]. Mobile telephony has already penetrated the world's remoter areas to bring learning to rural communities such as those in Africa[6].

People can receive learning content with text, graphics and moving images on their mobile devices. Automated audio learning alerts, reinforcement and tracking also take place this way. In addition, small course elements are constantly repackaged and sent to users as a matter of course following a learning session – to a mobile device – for learning reinforcement and retention assessment[2].

Mobile telephony is providing interactive elements that go beyond simply listening to, or viewing, a stored message. Systems include an integrated voice response function that allows user interaction through the phone's keypad to answer test or survey questions[2]. Users verify receipt of the session notification and each session is logged to record access time, whether totally completed, partially attempted or aborted (push model).

Remote workers can also dial in to request learning content on demand, which is delivered at the time specified (pull model). Most organisations track each session as part of an individual's learning record and for collation into the organisation's overall learning analysis.

Software is enabling all forms of digital learning content to be instantly repurposed for use in a virtual environment and via mobile devices[7]. Innovative learning environments are blending mobile learning, virtual worlds technology and global positioning for engaging packages.

New systems follow an individual's movements in real space and track their avatar within a virtual reconstruction of their environment – a hospital, government complex or bank, for example. As the individual moves close to certain designated locations, they trigger individualised access to learning content, such as an update on the latest neurological technique.

Content is pushed to the individual depending on their location and device – on the roof of a historical building using a handheld device, for example. The system also logs how users have interacted with the learning content for later assessment and adaptation.

These tracking systems also link to social computing technology that enables people to collaborate and learn face-to-face in the real world. Alternatively, they can meet using telepresence technology, or personal avatars, to overcome the problem of geographical distance.

1. http://www.giuntilabs.com/
2. http://www.apple.com/iphone/
3. http://www.apple.com/ipodtouch/
4. http://mlearningworld.blogspot.com/2007/12/ipod-in-education-video-overview.html 12/07
5. http://eprom.mit.edu/index.html
6. http://www.onpointdigital.com/cellcast/
7. http://www.giuntilabs.com/info.php?vvu=15&pud=443 11/07

T6. Social networks and collaboration

The 'Wisdom of Crowds' – an established 21st century business concept – has rapidly escalated across organisations in search of innovation. The earlier examples set by Linux, Wikipedia, YouTube, Second Life, Google and eBay have been added to regularly even by mature businesses. This new modus operandi revolves around four powerful ideas: openness, peer groups, sharing and acting globally[1].

Individuals are generating their own online content, bombarding each other with a mass of information, which users categorise through social tagging[2,3,4] – a fast online search tool. Tagging enables people to form networks around specific interests, share resources and find new insights by discovering what other people think.

Social networking in a corporate environment continues to grow, particularly in organisations where the majority of staff work off-site – from home or customer locations. Staff visiting online corporate forums now use social tagging as the norm. This facility enhances corporate search engine capability to draw associations between people and concepts.

Companies have enhanced corporate social networking by creating internal versions of external social tagging sites, such as the old facebook[4]. Staff can easily access the details, blogs, wiki participation and interests of individual employees and other corporate stakeholders. Clicking on an individual's name either creates an instant message or allows the user to view the individual's tags. These systems incorporate other social networking tools, such as Google maps, which show where colleagues are physically located.

E-communities are bridging time zones and distance, making it easy to meet people with specific expertise. For example, a production engineer in Hull with a problem at 3am can easily get help from another engineer in Silicon Valley, Bangalore or Shanghai. Corporate wikis are used routinely for collaboration and contribute to corporate conversations that share knowledge, innovate and find solutions.

To thrive in a social computing era, companies are recognising the need to move away from traditional leadership styles and partner with employees and other stakeholders through dynamic online communities.

Informal leadership through blogging complements formal positional leadership and shifts traditional powerbases. Employees are keen to read the blogs of people with an interesting perspective whoever they may be. Operating in a more collaborative way, several organisations regularly create massive online 'jams' – events running over 48 to 72 hours – to discuss focused topics, for example, company values or client solutions.

1. http://www.businessweek.com/innovate/content/feb2007/id20070201_774736.htm?chan=innovation_special+report+--+the+businessweek+wikinomics+series_the+businessweek+wikinomics+series Business Week, 02/07
2. http://www.flickr.com – upload and tag photos
3. http://www.technorati.com – compiles blog posts and other content. Tagging here is so valuable that the site began has selling advertising with proximity to popular tags
4. http://www.facebook.com – supports social networking between friends. Users upload photos, notes and news, and tag friends and associates

T7. Body area networks (BANs)

Body area networks (BANs) consist of mobile and compact intercommunicating sensors, either wearable or implanted into the human body, which monitor vital body parameters and movements. These devices communicate through wireless technologies and transmit data from the body to a base station, from where the data can be forwarded real-time[1].

Although used initially in healthcare for constantly monitoring vital signs in diseases such as diabetes, asthma and heart attacks, BANs have become more widespread in other sectors. They communicate by seamless exchanges of information between individuals, or between individual and machines. Imagine being able to exchange business information through a handshake[2].

BAN sensors are routinely embedded into 'smart' materials[3] using nanotechnology. Products ranging from shoes[4] to palmtops and earrings carry sensors that monitor an individual's bodily changes and emotional state. Sensors then transmit the results to personal interfaces such as a mobile phone, or to another specified point such as a health centre or nominated individual.

Following the success of cars with sensors embedded in the steering wheel, driver's seat, and other components touching the driver's body[5, 6], office furniture containing sensors has become widely available. Sensors detecting signs of emotional stress or tiredness respond by cooling the air, temporarily diverting calls, sending an alert message, or playing a soothing music selection.

People wanting 'always-on' communications implant BANs in their body – a phone printed on their wrist or a video screen in their contact lens[3], for example. These devices work by drawing on body heat or a user's physical activity to maintain their charge.

Sharing data with devices beyond a personal body area network has become accepted practice now security concerns have been overcome. Imagine wanting to check on a telepresence session. You call out: 'What time is the telepresence?' The watch printed on your wrist checks your online diary and displays the time on the watch's face. On moving through your client's building, sensors detect your presence and relay meeting information to your palmtop. You are feeling tense before this important meeting and your BAN senses this, relaying information to the room's air control system which lowers the temperature temporarily, while a calming meditation session plays through your tiny earpiece.

1. *http://en.wikipedia.org/wiki/Body_area_network*
2. *http://www.research.ibm.com/journal/sj/353/sectione/zimmerman.html*
3. *http://news.bbc.co.uk/1/hi/technology/4059011.stm* BBC news 12/04
4. *http://arstechnica.com/news.ars/post/20071206-ieee-launches-new-working-group-for-body-area-network-tech.html* 12/07
5. *http://findarticles.com/p/articles/mi_qn4155/is_20020211/ai_n12452595* Chicago times 02/02
6. *http://ttt.media.mit.edu/impact/convergence02.pdf*

T8. Nanotechnology

Nanotechnology[1] is the highly multi-disciplinary field of applied science and technology covering the use of matter at the atomic and molecular level and fabricating machines of that size. Nanotechnologies have already resulted in the creation of products such as cosmetics, fabric coatings[2], specially strengthened materials, batteries and stain resistant clothing.

These technologies have moved beyond materials redesigned at the nanoscale to actual nanoscale devices[3]. For example, 'identi-chips', tiny position locators for anything from pets to humans, which can be worn in clothing or introduced into the body. Some devices sense the environment by exploiting the huge surface area of carbon nanotubes[4] and other nanostructured materials to detect environmental contaminants. Other nanodevices can process information, or convert energy from one form to another.

In recent years, molecular nanosystems have come to operate in a wide range of environments. Minute computers and robots have been developed that play a part in gene therapies and anti-aging treatments. Ever more sophisticated interfaces are linking people directly to electronic and communications devices to improve knowledge share and information processing.

Scientists have copied cell biology to create sophisticated nanoscale machines such as the molecular motors driving muscle, converting chemical energy to mechanical energy or ion pumps that control the flow of molecules through membranes[3]. However, the release of new nanoproducts into the public domain is now more restricted than at the turn of the millennium. New materials, particularly for use inside the human body, are taking time to get into commercial production and require rigorous testing.

Medical scientists have developed sophisticated ways of encapsulating molecules and delivering them on demand for targeted drug delivery[5]. These advances have led to the increasing business and educational application of dispensing 'smart' drugs to help learning, memory retention and feelings of well-being.

Workers continue to cultivate expertise with systems of nanostructures, directing large numbers of intricate components to specified ends[6]. One application is the guided self-assembly of nanoelectronic components into three-dimensional circuits and whole devices. Medicine employs these systems to improve the tissue compatibility of implants, create scaffolds for tissue regeneration and build some artificial organs, such as the liver, to assist damaged tissue.

Competencies in nanotechnology are increasingly important[7] – both in terms of creating jobs and for companies to remain competitive. Globally, universities and companies are collaborating closely to ensure nanomanufacturing continues to innovate, increase profitability and provide employment.

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2. http://news.bbc.co.uk/1/hi/technology/4059011.stm
3. http://physicsworld.com/cws/article/print/19961
4. http://www.research.ibm.com/topics/popups/serious/nano/html/nanotubes.html
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6. http://www.sciam.com/article.cfm?articleID=00029E0B-34C6-14C0-AFE483414B7F4945
7. http://www.bmbf.de/en/nanotechnologie.php

T9. Artificial intelligence

Artificial intelligence (AI) has become integrated with e-learning[1] to produce 'intelligent e-learning' (IEL) systems. IEL has now progressed significantly beyond early AI systems, to teach a language, for example[2]. Now combined with AI, e-learning is no longer simply a passive exchange of learning between user and computer. Instead, the individual's learning is actively mediated by an avatar – the AI part of the system. AIs have infinite patience to help learners and provide detailed feedback[3] as learning progresses.

Current programmes provide high-quality virtual reality that simulates real-life situations – for train drivers, construction workers, riggers and production line employees, for example. This type of learning has been particularly beneficial for hard-to-reach groups where attendance at traditional face-to-face events has been expensive and difficult to arrange.

AIs assess a learner's strengths and weaknesses as they progress through a programme. As a result, the AI adapts the programme through an understanding of the learner's capabilities. The AI, represented by an avatar, recognises and adapts to the learner's difficulties and emotional distress. The avatar knows when the learner is struggling and provides further learning programmes and encouragement. As a result, learning retention is now more than 40 percent above many traditional human-based programmes.

Companies are also using AI programmes for corporate communication – to communicate changes in strategy, for example. In the case of global corporations, the AI instantly translates any text and even 'learns' dialects to make the delivery more locally relevant. These systems also provide a real-time feedback channel.

Most AI systems are based on earlier developments at the MIT Media Lab[4] that gave computers 'common sense' – the ability to understand and reason about the world as humans do. In this way, devices can understand people's goals and typical problems and computers now regularly assist executives in complex problem-solving. These intuitive computerised devices have become simply more 'human'.

Computer intelligence is so superior that, to make the most of the human/computer interface, individuals are starting to enhance their brain functions with neural implants. Without these implants learning is just too slow. This enhancement had already been predicted by Kurzweil[5] who said: 'Once machines become as intelligent as people, they will necessarily soar past us.' He added that computers evolve faster, remember more accurately and share information more efficiently than non-augmented humans can.

The amount of available knowledge is increasing exponentially, but computer knowledge has the key advantage of being directly downloadable from one computer to another. Although direct person-to-person transfer is now possible, using AIs to compute the information produces a far better synthesis than would be capable by human minds alone – even with direct linking.

Work is also progressing on transferring human minds to computers, by exact copying. The resulting AI, sometimes called an 'infomorph'[6] generates responses indistinguishable from the original organic brain. Experiments are underway to place the downloaded AI into a confining artificial body – an intelligent robot. The Tyrell Corporation is planning to use such robots as trainers in hostile situations such as battle zones, mining, space and deep sea environments.

AIs are regularly combined with human intelligence to produce a higher intelligence than either one could achieve alone[7].

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2. http://www.usc.edu/uscnews/stories/10321.html 06/04
3. http://www.aaai.org/AITopics/html/tutor.html
4. http://csc.media.mit.edu/
5. http://www.eetimes.com/special/special_issues/1998/timespeople98/kurzweil.html
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7. http://cci.mit.edu/about/index.html

T10. Genetic modification

Since the early 1980s, when a harmless bacterium was engineered to produce insulin for diabetics, hundreds of plants and animals have been successfully modified to provide a wide range of medicines and vaccines[1]. Future generations continue to carry the genetic modification, leading to new plant and animal varieties.

Over the years, genetically modified (GM) food has increased plant production by faster growth, in less fertile soil. GM plants yield better harvests that are more resistant to weeds, diseases and pests. But in spite of improved government controls, trade problems such as those experienced more than 10 years ago over GM soybeans[2], continue to surface periodically.

Today's computers are now so powerful they can simulate the consequences of many changes to DNA. As a result, GM plants, and more recently animals, can undergo extremely rigorous testing before being released commercially. This is helping to allay public fears, such as those of the late 1990s, where some GM crops caused problems in the food chain while others were considered unsafe to eat.

In medicine, genetic modification routinely overcomes the inherited disorders discovered during early pre-natal screening. Foetuses now have the opportunity of a normal life through interventions to repair their faulty genes. For example, inherited disorders such as Down's syndrome and cystic fibrosis have all but disappeared. However, many parents believe that 'playing God' is wrong and will not take part in pre-natal screening.

Since Professor Tsien's experiments with the smart mice strain, called Doogie[3], in the late 1990s, scientists have continued their genetic tinkering to make animals smarter. The original researchers added a single gene to mice that significantly boosted a mouse's ability to solve maze tasks, learn from objects and sounds in their environment – and to retain that knowledge[4].

Although theoretically possible, enhancing human cognitive abilities through genetic modification alone is still proving elusive – and controversial. Brains can be imaged for activity, but pinpointing a corresponding 'intelligent' gene is difficult. Researchers are concentrating their efforts on families with known 'super traits' – musicians, artists and scientists – in the search for genetic commonalities.

Gene therapy is continuing to treat various cancers[5] and also disorders involving memory loss. Trials are underway to use gene therapy, or 'gene enhancement' in a non-clinical setting, to make memory and learning improvements more widely available. However, the ethical issue of permanently increasing people's natural capabilities is still a hot discussion topic.

Some argue that the line between health and disease is so fine that policy makers should not attempt to draw it. Others see the aging process itself as a medical condition and therefore one that should be treated.

Developments in human genetic modification still hit the headlines and in the UK, the 'designer babies' spectre continues to fuel public concern. Other countries – notably the USA, Russia and China – are genetically enhancing the features of babies, such as their hair and eye colour, 'on demand'. In January 2020, 'Sunday Times Online' carried several web pages and chat forum, 'Design-a-Descendant', to further promote the current ethical debate.

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2. http://news.bbc.co.uk/1/hi/world/europe/7188087.stm 01/08
3. http://www.gene.ch/gentech/1999/Sep/msg00013.html
4. http://news.bbc.co.uk/1/hi/sci/tech/435816.stm
5. http://www.cancer.gov/cancertopics/factsheet/Therapy/gene