
Corporate developments and strategic alliances in e-learning

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Keywords

Learning, Strategic alliances, Partnering, Information technology, Developments

Abstract

The combination of the demand for access to continuous, flexible education and training, and the arrival of the increased bandwidth of more powerful information and communication technologies is stimulating extensive corporate developments in the e-learning industry. Strategic alliances of leading universities, e-learning and technology companies are forming to provide online delivery of sophisticated, media rich, interactive education and training on a global basis. Hundreds of e-learning companies are competing in this new marketplace with content, technology and services. Major companies are establishing their own corporate universities. The question is whether the potential for interactive online knowledge communities is achieved, or if this new technology is primarily employed in relatively routine skills training.

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Introduction

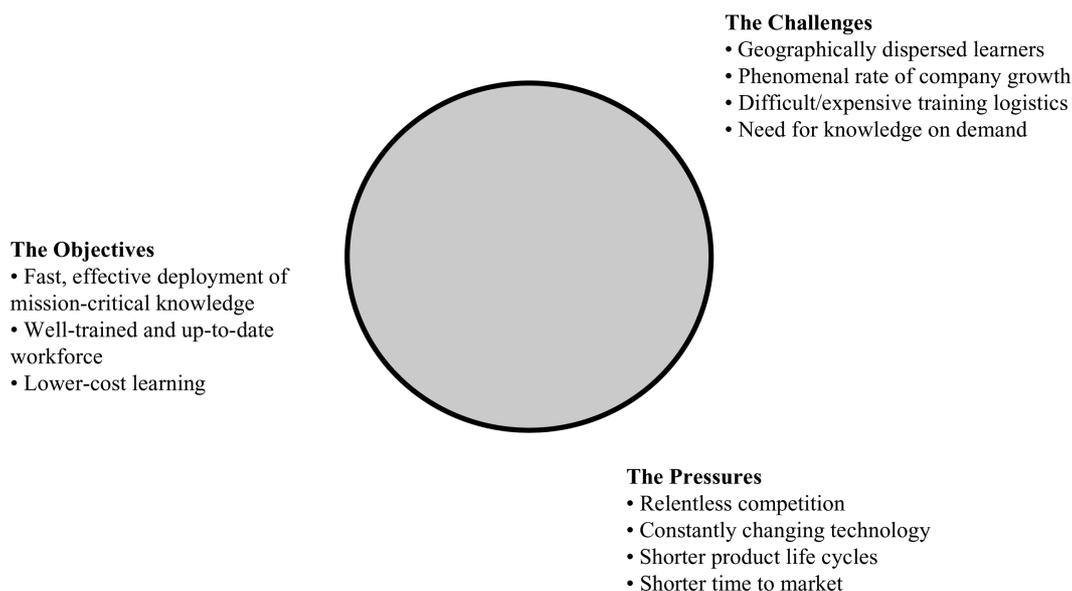
Education and training is poised to become one of the largest sectors in the world economy. Merrill Lynch estimates global expenditures of education and training at over US\$2 trillion. About one third of this spending is in North America, half in Europe and the other developed market economies, and 15 per cent in the developing world (Stacey, 2000).

In the USA the US\$772 billion education industry is the second largest sector of the economy at 9 per cent of GDP, the largest being healthcare. (Hambrecht & Co (2000, p. 3) estimates of the US market segment expenditure in 2000 was childcare US\$40 billion; primary and secondary education US\$386 billion; post-secondary education US\$268 billion; corporate training US\$66 billion; continuing education US\$12 billion).

It is therefore not surprising that as the education and training sector continues to grow it is increasingly subjected to pressures to change. Among the factors fuelling the drive towards alternative forms of delivery of education are the:

- advance of globalisation with a demand for world class products, services and technical infrastructures;
- emergence of post-industrial information age, with sophisticated communications systems, and the explosive growth and distributed nature of new knowledge;
- demand for greater access to tertiary education and the need for lifelong learning created by rapid changes in the economy;
- growing reluctance on the part of governments to fund the increasing demand for higher education;
- resultant increasing costs of higher education and the growth of the earner-learner market (as distinct from the learner-earner market);
- dissatisfaction of industry with the responsiveness of traditional providers (Cunningham *et al.*, 2000, p. xv)

Corporations are wrestling with the implications of these changes as technology increases the complexity and velocity of the work environment (see Figure 1). As companies compete fiercely for highly skilled people a PriceWaterhouseCoopers survey indicates 70 per cent of large companies cite lack of trained employees as a major barrier to growth. However, two thirds of traditional training costs are allotted to travel expenses to distance

Figure 1 Drivers of Cisco's learning and training needs

Source: Cisco Systems

centres (Hambrecht & Co, 2000, pp. 3–4) Knowledge workers require flexible and continual learning rather than occasional, highly structured courses, that is learning anywhere, anytime for anyone.

New forms of education and training focus upon the working adult market with an emphasis upon practical and relevant skills and qualifications. The mission, governance, culture, and business models of these providers are radically different from publicly funded traditional educational institutions:

The new providers . . . eschew research, community service, a comprehensive curriculum, and security of staff employment . . . In the for-profit organisations, disaggregation of the academic roles of curriculum developer, teacher, researcher, examiner and community service provider is proceeding apace, and even in the traditional higher education sector there is movement in this direction (Cunningham *et al.*, 2000, p. xvi).

Web based training in the USA is forecasted to climb from \$550 million in 1998 to \$11.4 billion in 2003 (Figure 2). Though IT training has dominated Web delivery there are indications that softer skills of business management will increasingly be available in a media rich, customised, highly interactive form on the Web. Dramatic growth rates are anticipated in all three sectors of e-learning provision – content, technology and services (Figure 3)

In a volatile market environment of often speculative investment, with dramatic

advances in the technology of delivery, an increasing number of institutions and companies are energetically engaged in pursuing new education and training opportunities through:

- *Strategic alliances.* The sudden emergence of ambitious global networks of leading universities, e-learning companies, and technology companies engaged in strategic alliances to extend online infrastructures globally.
- *E-learning companies.* A rapid proliferation of e-learning companies, innovatively disaggregating the education and training value chain by inserting new modes of electronic delivery at critical stages.
- *Corporate universities.* The establishment of a growing number of “corporate universities” by large companies investing in their own delivery systems for education and training;

Driving each of these developments is the insatiable demand for learning in the knowledge-based economy combined with the new technological infrastructure of e-learning that promises universal access.

Principles of e-learning

The vital principles of e-learning are:

- *Scalability.* E-learning can be scaled almost infinitely at little additional cost.

Figure 2 Growth of the US Internet-based training market by training product

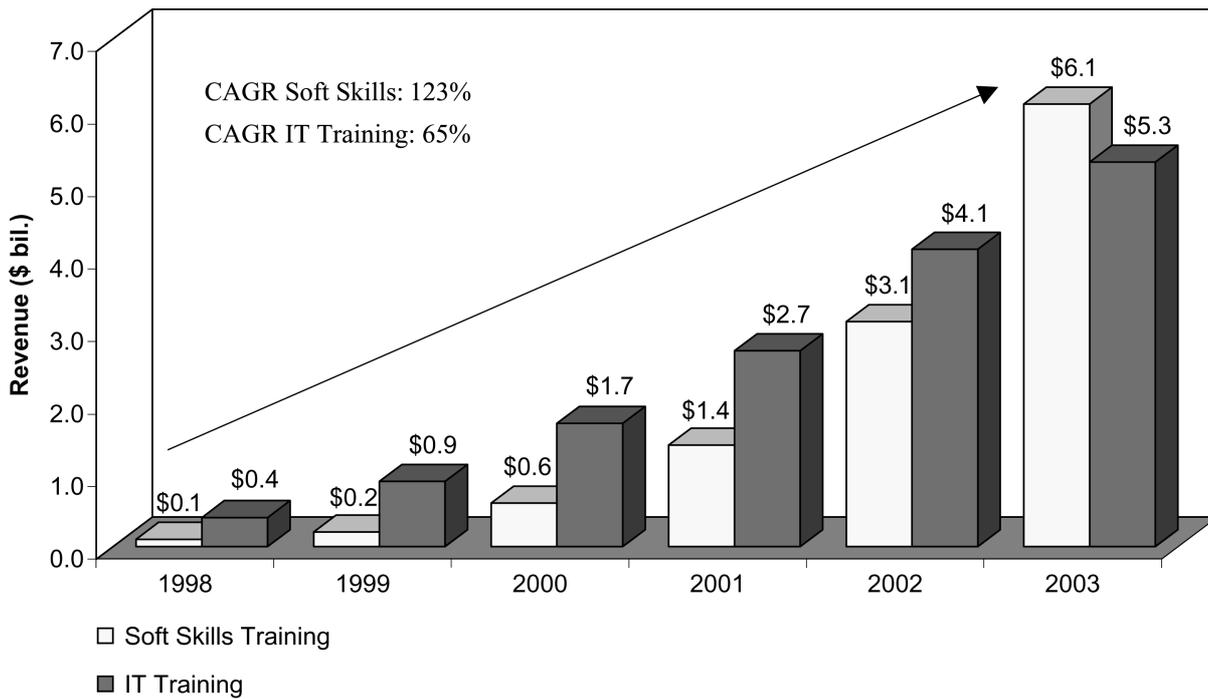
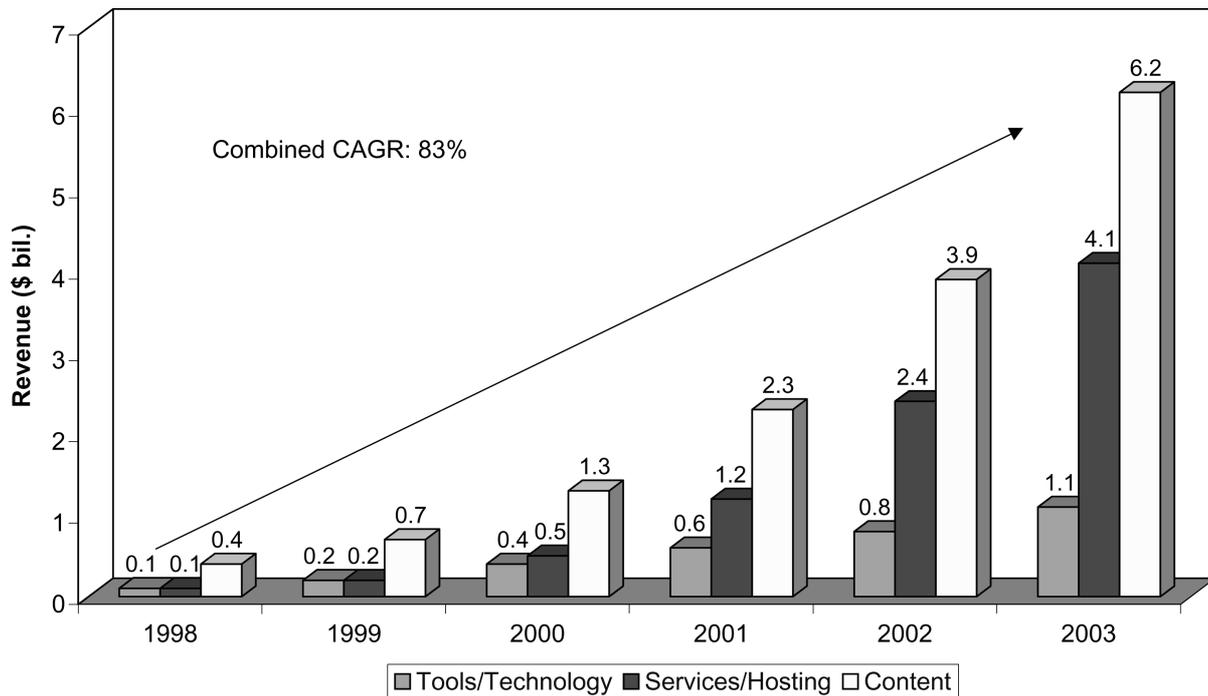


Figure 3 Growth of the US Internet-based training market by market segment



- *Access.* E-learning is available anywhere there is an Internet connection.
- *Timeliness.* E-learning can be continually updated with new information and knowledge relatively cost effectively.

In contrast, traditional modes of delivery lack all three characteristics – an instructor can only be available to so many people at a time,

is not available anytime and anywhere to the learner, and may not be up to date with the most recent information and ideas. Delivery of e-learning can either be synchronous, with participants logged on together in virtual classrooms, or asynchronous in which courses are self-paced taken via the Internet, CD-ROM, or streamed audio-video Web presentation.

Web-based education

As identified by the report of the Web-based Education Commission to the US Congress, chaired by Kerrey (2000) there is an emerging technological infrastructure for high quality, Web-based education that could lead to accelerated applications over the next few years:

- *Higher bandwidth* of greater broadband access and better data packet handling capabilities resulting from the Internet2 project will enable richer interactive environments.
- *Pervasive computing* in which processing, connectivity and communications technologies connect small, multi-purpose devices linked by wireless technologies that will allow remote areas to take advantage of the Web.
- *Digital convergence* merging the capabilities of different media will allow increased capability to broadcast materials and software in text, video and audio format.
- *Technical standards* for content development and sharing as with the origins of the Internet, the US Advanced Distributed Learning (ADL) initiative led by the Department of Defense, with academia, the private sector, and the technology sector has developed standards for interoperability known as the Sharable Courseware Object Reference Model (SCORM).³ Despite sounding like a new Scud missile, these standards actually provide the foundation for the learning environment of the future.
- *Schools interoperability framework* (SIF) similarly is a US industry initiative of over 100 hardware and software companies and school districts to ensure that school instructional and administrative software applications can work together, enabling diverse applications to interact and share data regardless of platform, developing a framework for Web-based portals.
- *Adaptive technology* is emerging that combines speech recognition, gesture recognition, text-to-speech conversion, language translation, and sensory immersion to change the substance of network enhanced human communication (<http://interact.hpcnet.org/webcommission/preface.html>)

Strategic alliances

The most exciting thing about e-learning are the strategic alliances it is stimulating between giant technology and media companies, leading international universities, and enterprising new e-learning companies. The scale of these alliances in terms of corporate resources at their disposal, and the potential scope of the alliances in terms of the richness of the educational content available, together with the dynamism of the alliances often fuelled by associated e-business ventures, threatens to create an e-learning environment in the future of immense influence and penetration. Partnerships enhance product offerings, expand distribution channels, and explore new market segments. As the equity research company W.R. Hambrecht & Co investigating the investment opportunities of e-learning put it:

This business model combines two groups of market participants with mutual interests. Academic institutions, the major producers of branded educational content, recognise the need to offer and distribute their degree programs online, but generally do not have the technical or financial capacity. E-learning companies, on the other hand, see the opportunity of building a brand more quickly and less expensively using the “Intel inside” concept. As more competitors enter the market, we believe that accreditation of the new online universities and exclusivity of partnerships will be essential for differentiation among e-learning competitors (Hambrecht & Co, 2000, p. 24)

Cataloguing the increasing array of strategic alliances in e-learning is not an easy business, due to the speed of creation of these alliances, the complexity of the relationships between multiple partners, and their tendency to rapidly transform into something different from what was originally conceived (together with a high failure rate and dismantling of alliances, often as part of the restructuring of new strategic alliance formations). However, it is possible to highlight the characteristics of some of the major strategic alliances in e-learning presently.

Unext

Unext (<http://www.unext.com>) with headquarters in the USA is a consortium of universities including Columbia, Stanford, Chicago, Carnegie Mellon and the London School of Economics which intends to provide MBA business courses to multinational companies through the newly

formed online Cardean University. They have three Nobel Laureates on the faculty, and investors including Michael Milken of junk-bond fame, and Larry Ellison, CEO of Oracle. It plans to use the Internet to create a learner-centric environment that is both personalised and interactive, applying multimedia simulations, video clips, collaborative exercises, case studies, real-time online mentoring, with the goal of creating virtual learning communities. Unext captures academic knowledge online, and has invested \$100 million in course development prior to enrolling students. It is focusing upon providing continuing education for working adults and for companies, and hopes to start teaching in mid-2001. Projecting potentially millions of students in the future, Unext courses come from participating universities, administered through the Unext entity.

Fathom

Fathom (<http://www.fathom.com>) is an e-learning portal established by a group of leading universities and cultural institutions comprising Columbia University, London School of Economics, Cambridge University Press, the British Library, Smithsonian Institution's National Museum of Natural History, and the New York Public Library. These eminent sources will use the portal for aggregating, hosting and distributing content to provide e-learning opportunities on a wide range of subjects to a diverse life-long learning population. Fathom's tools and resources are overseen by an advisory board drawn from its partners, and also offers an access channel for the purchase of books, periodicals, and articles.

Universitas 21

Universitas 21 (<http://universitas.edu.au>) is a company incorporated in the UK with a network of 18 universities in ten countries which collectively enroll approximately 500,000 students each year, employ 44,000 academics and have a combined operating budget of \$US9 billion. It is hoped this network will enable the pursuit of agendas beyond the individual capabilities of members. The central objective of this consortium is to present "a simple, defensible basis for differentiating member universities from others characterised by a less developed or less comprehensive involvement in research and/or in research-

enriched teaching and learning." Whether a self-selecting group of international universities could achieve this research branding remains to be seen. Universitas 21 has three different e-learning companies for content, intellectual property rights, and delivery system. The consortium hoped to provide premium higher education programs by e-learning throughout the world in a joint venture with the unlikely partner of Rupert Murdoch's News International, however, this particular venture now appears to have been abandoned.

Scottish Knowledge

Scottish Knowledge (<http://www.scottish-knowledge.com>) is an alliance of Scottish universities and businesses with Scottish Knowledge acting as a broker and global commercial marketing partner. Launched in 1999 it has developed materials as needed, and focused on key markets. It offers modular programmes built from multi-source suppliers to provide tailor-made solutions for clients.

Western Governors University (WGU)

Western Governors University (<http://www.wgu.edu>) in the USA is a partnership between 40 universities who are sharing resources. The emphasis is upon "competency-based assessment, testing and credentialing performative knowledge rather than discursive or expository knowledge" (Cunningham *et al.*, 2000, p. 46). WGU campaigned for dispensation from US Federal regulations regarding financial aid to students that educational providers had to offer no more than 50 per cent of their programs via distance learning, and have no more than 50 per cent of its student body as distance students. But WGU badly overestimated student interest and set the ratio of students to adviser-mentors too low at 25:1, and students were not happy with the series of fees they needed to pay. In 1999 the WGU turned to business corporations looking to outsource elements of their training. Subsequently, a venture with the private US arm of the UK Open University proved unviable.

Open University of Catalonia (UOC)

The UOC is a public-private partnership operating with a network of spin-off and joint venture businesses funded by state and

private capital. It employs virtual teachers from universities in Spain and globally, and has grown to 20,000 students and 16 on-line virtual courses at bachelor, masters and doctorate levels. Based in Barcelona it covers Spain, the Spanish speaking Americas, and is moving to provide English language offerings globally.

Pensare

Pensare is in a collaborative partnership with over 45 “major brandholders” among academic institutions including Harvard Business School Publishing, Duke University, Wharton School of Business, University of Southern California, corporate universities, and leading business authors. Pensare offers an interactive e-learning solution integrating content, technology and services aiming to create knowledge communities tailored to specific organisations. The company uses technology that incorporates knowledge capture and sharing, multi-user simulations, online discussion groups, interactive exercises, and knowledge libraries. The goal is to create an environment where learners share information, collaborate in study and project groups, and learn from each other.

University for Industry (Ufi)

The Ufi’s mandate is to enhance individual skills and improve competitiveness of UK industry, supporting lifelong learning and e-learning. It supports the “learndirect” information, advice and e-learning network through a series of locally supported hubs in host colleges and learning centres.

NextEd

NextEd is an education and training infrastructure company which partners with universities and others to deliver courses over the Internet to the Asian market. Hong Kong backed and funded with e-learning technology platforms in six countries it provides educational institutions with a technology infrastructure to offer accredited higher education content and professional training to adult learners.

Global Learning System

Global Learning System is a Web-based corporate training company that recently merged with the European Training Group (ETG) based in The Netherlands. ETG has 60 training locations in 15 countries offering

multi-language modules to international corporations using the Internet, CD-ROM, connected DVD, satellite and related access systems.

Pearson Learning Network

Pearson plc is one of the world’s largest media companies. Based in the UK, it has undertaken a series of strategic alliances to extend its reach through on-line education. Pearson Education is one of the largest providers of curriculum materials in print, electronic and on-line formats in both schools and higher education. It has plans to offer a full range of accredited courses in the USA in partnership with leading business schools and professional bodies. Pearson’s on-line Learning Network consists of four integrated networks to serve four distinct learner markets with revenues intended to be generated by subscriptions, sponsorship, advertising and product sales. The networks share common technology and marketing. The separate networks are for higher education, professional development, lifelong learning, and for schools.

i-Global

i-Global is an Australian based e-learning venture aimed at the corporate sector in the Asian and Latin American education markets. Part owned by UTS Sydney, it will offer a range of courses from several universities and private companies. Offering curriculum design, content development, marketing, sales and delivery, together with learner support, assessment and credentialling, iGlobal offers a full suite of e-learning content and services to partner organisations on a long-term alliance basis.

Disaggregation of the higher education value chain

The gradual disaggregation of the higher education value chain promised by the intervention of strategic alliances in e-learning is an opportunity for a whole range of new entrants offering separate components of e-learning. The possibility exists of a transformation in the education industry, altering the historical role of universities by providing opportunities for commercial partnerships and at the same time new competitive threats. Illustrations of

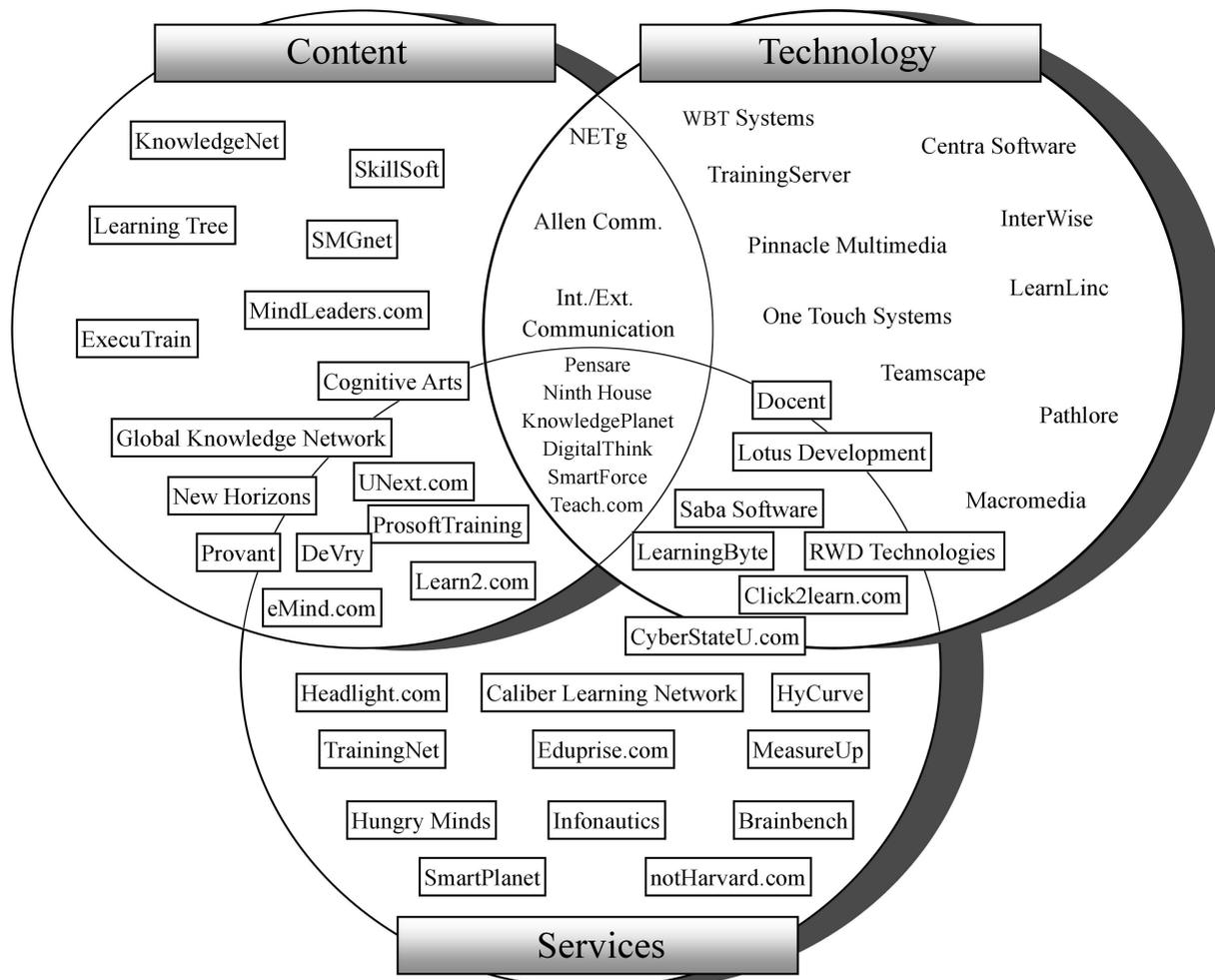
disaggregation include on-line admission and applications, e-learning portals, supplementary content providers, on-line libraries, on-line advising and tutoring, on-line simulation exercises with advisory support, external assessment services, student activity/portal sites, on-line text book distribution, and campus based portals.

E-learning companies

The galaxies of start-up companies in the e-learning universe are portrayed in Figure 4. What is immediately striking is how all of these companies have abandoned the formal names of education and training, and replaced them with a sense of the immediacy, speed and universality of the world of new technology, with obligatory references in company names to global, knowledge, planet, network, digital, and brain, with

notHarvard.com winning the prize for upsetting the educational establishment. Though most of the companies are relatively small, what is impressive is the increasing profusion of e-learning companies (one recent estimate was that there were several hundred e-learning companies in the USA alone, though these numbers have been greatly depleted in the dot.com tech wreck of the last year). Second the speed of evolution of e-learning companies as they explore new business models, acquire new technical capability, and develop new partnerships is remarkable. As in other sectors of the new economy, the trend among e-learning companies is to announce as many alliances and partnership agreements as possible with big-name companies. These are essentially efforts to bask in someone else's glory. It is rare for any small e-learning companies to have an exclusive agreement with any major technology company.

Figure 4 Corporate e-learning universe



Source: WR Hambrecht + Co

Some of the leading e-learning companies emerged out of the traditional educational and training sectors, and while their core competency – educating people – remained the same, they had to change their methods of reaching people. However, most of the e-learning industry is still immature and highly fragmented. Start-up companies are energetic in leveraging the Internet as learning space, but they lack resources to develop the extensive services they aspire to provide. The industry is presently a complex of technology companies offering e-learning platforms, content providers offering learning materials, and service providers offering technical support. Other companies are attempting to offer a more integrated e-learning service, and included among these are:

Saba

Saba provides technology platforms for e-learning, with an infrastructure that is highly scaleable, standards based and content neutral, and has two million people licensed to learn on Saba's systems. Saba has three principal product groups: learning enterprise, learning provider and learning exchange. Learning enterprise is a learning management system that allows corporate customers to establish knowledge and competency goals. Learning provider is an Internet-based learning network that allows internal and external providers to develop, sell, and distribute on-line and off-line learning content to organisations worldwide. Learning exchange is a global, Internet-based B2B learning marketplace, designed to enable businesses, governments, and learning providers to buy and sell learning offerings and collaborate with learning communities. To build content compatibility with its technology Saba has a wide network of e-learning content partners. Major clients of Saba include Lucent, DaimlerChrysler, Ford, GE, and Proctor & Gamble.

DigitalThink

DigitalThink is a leader in Web-delivered corporate IT training space, providing training solutions including content, technology, services and e-commerce. Having already provided 150,000 "training seats" in an illustration of the power of scalability, it is able to ramp up seats to 600,000 if required. This includes the dot.com world's 24 hour/seven days a week online tutoring and

support. It develops and delivers Web-based IT training courses for programmers, software developers, and system administrators in the technology, financial services, healthcare, telecommunications and retail industries. DigitalThink aims to build online classroom communities and offers live mentoring, multimedia wizards, and simulations. DigitalThink has a large network of partnerships and strategic alliances, including KPMG, GE, Amazon.com, Microsoft, Adobe and the University of Phoenix. Its customers include the Silicon Valley hall of fame such as Cisco Systems, Intel Corporation, Sun Microsystems, and Hewlett Packard.

NETg

NETg (National Education Training Group) provides content and technology including authoring, a training management system, and Web hosting. NETg has formed a learning management alliance to make NETg courseware compatible with other learning management systems. IT training courses are targeted at large corporations in the USA and overseas. With a portfolio of 600 off-the-shelf training courses in several languages it has a client base that includes many of the Global 100 companies. All of NETg courses allow the manipulation of content and customisation of modular courses. Partners in the learning management alliance include Saba, Click2learn, KnowledgePlanet, and Knowledge Networks.

Click2learn

Click2learn provides off-the-shelf and customized software applications and services to create, deploy and manage Internet-based training. In addition, it is establishing a learning portal to collect and distribute content in the areas of IT and soft skills training to professionals, corporate intranets, Web portals, and higher education institutions. Click2learn has formed content distribution relationships with a range of other e-learning companies and with Macmillan Publishing. Professional services account for most of Click2learn's revenue including custom application development, organisational assessment, and system implementation. Major clients include Arthur Anderson, Prudential, Boeing, and Hewlett-Packard among other blue-chip companies.

KnowledgePlanet

KnowledgePlanet offers a workforce performance management system integrated with an e-learning marketplace where training and HR professionals can evaluate and purchase training products and services provided by a range of companies. The marketplace provides quality ratings for courseware. In this way the suppliers and users of e-learning content are brought together, providing a more efficient solution to workforce development. The KnowledgePlanet system focuses all workforce development activity on attaining skills and desired performance levels required by an organisation, with the system customised to integrate the organisation's workflow and human resource management system. Employees receive a personalised competency profile based on current and required skills. Major clients include Goldman Sachs, Morgan Stanley, Zurich, Chevron, and Glaxo.

Smartforce

Smartforce is the largest and best-established e-learning company, with over 2,000 corporate customers and about 4.5 per cent of the US market. Formerly CBT Systems, in 1999 Smartforce transformed into a fully integrated, Internet-based provider. While originally like many other e-learning companies in IT training, Smartforce has moved on to business and skills training, and is looking to offer an online business degree program. The company has a content library of over 1,200 titles, most of which have been authored in, or converted into Java or DHTML, removing the need for customers to install new software or plug-ins. Smartforce offers online seminars on IT and business topics led by experts, bringing together streamed audio and video, graphics and animation, and interactive and collaborative learning features. Corporate customers receive a complete e-learning environment from Smartforce, and the company has created Smartforce hosted corporate e-learning universities for several large clients with the aim of building online learning communities. For example, there is an agreement with Dell to create EducateU.com a global online community for Dell customers, and with Microsoft to create an online community for more than 600,000 Microsoft certified professionals. Recently

Smartforce was selected by a consortium of the largest universities in the USA to provide Smartcourses to staff and students via campus intranets. Smartforce is in partnership with a network of content providers including Microsoft, Lotus, SAP, Oracle, and Intel and among its major clients are Alcatel, AT&T, British Airways, Cambridge Technology Partners, PriceWaterhouseCoopers, and Reuters (Hambrecht & Co, 2000)

Corporate universities

Corporate universities are a parallel development in the e-learning revolution, where large companies feel the need to express an institutional identity upon their renewed commitment to enhance the education and training of their employees. One estimate suggests there are 1,600 corporate universities in the USA alone, that invites some scrutiny of what is being called a "university". Most corporate universities are in fact re-badged human resources/information/training departments of organisations, with little change beyond the name (Cunningham *et al.*, 2000, p. 13). In one survey of corporate universities 82 per cent of organisations used the name mainly to convey corporate culture; 95 per cent link activities directly to business goals; only 5 per cent claim to have a focus on life-long learning; though 42 per cent provide courses that could generate academic credits at an educational institution (Densford, 1999).

A more convincing manifestation of the corporate university is a new vision of the HR/training function articulating a belief in Senge's learning organisation, though the corporate intention translates into "the goal of achieving tighter control and ownership over the learning process by more clearly linking learning programs to business goals and strategies" (Meister, 1998, p. ix) There is often this dichotomy between a training culture focussed on business goals, and a learning culture focussed on personal as well as company developments (Mills, 1999).

It could be claimed companies have misappropriated both the name and concept of a university to "provide the image of the grand intent of their initiative" (Meister, 1998, p. 35), without concerning themselves unduly about the associated substance of their activities. Richard Katz and Associates (1999, p. xiv) suggest that to validate their training agendas, corporations "have begun to

appropriate the linguistic icons of higher education” with the use of terms such as campus for the Microsoft headquarters in Seattle, and McDonalds’ “Bachelor of Hamburgerology”. The primary objective of corporate universities is improving performance of the organisation by better trained and informed people, but the irresistible spin-off has been extending their training courses into a new service product, offering courses to suppliers and customers, with some 25 per cent of corporate universities attracting revenue in this way (Cunningham *et al.*, 2000, p. 14).

Various classifications of the differing levels of commitment of corporate universities have been suggested. Fresina (1997), cited in Athey (1996, p. 6), perceives three levels of corporate universities: the first level provides skills training in operational excellence as at McDonalds; the second level provides training in new ways of doing things and managing change as at Amoco; the third level envisages education and training as a strategic mechanism for driving and shaping the organisation as in General Electric.

Another classification by Wheeler (2000) proposes four types of corporate university.

- (1) *Corporate community colleges*:
 - equivalent to training function;
 - focus on individual skills.
- (2) *Corporate vocational universities*:
 - change agents;
 - some involvement with knowledge management;
 - certification.
- (3) *Minor league universities*:
 - change drivers;
 - involvement with knowledge management;
 - experimental mindset on delivery and development;
 - partnership with academic institutions;
 - strategic networks.
- (4) *Ivy league universities*:
 - radical change agents;
 - act as knowledge management centers;
 - heavy R & D efforts around talent development and acquisition;
 - may offer degrees and be accredited.

A brief description of four corporate universities illustrates these different

orientations in terms of objectives and operations.

General Motors University

Founded in 1999 to provide training for GM’s 650,000 employees worldwide, and to reduce the US\$1 billion GM spends annually on training and development. With 11 functional colleges (manufacturing, information systems, communications etc.), it is governed by a Dean’s Council (functional heads) and a Customer Council. It has established discovery centres to go outside GM to capture knowledge.

Disney University

Committed to perpetuating Disney’s personal and business philosophy and corporate culture. With decentralised training in the field by Disney educators, Disney uses SWAT (specialists with advanced tools) to move around the leisure parks and train staff.

EducateU.com (Dell Learning)

Intended as the strategist, consultant and collaborator of educational solutions for the business serving employees, management and investors. Committed to life-long learning, with the principle the marketplace for learning is boundaryless, flexible and scaleable. Offers two types of training:

- (1) *Learning to know*: knowledge about the organisation, its processes and systems that has wide applicability.
- (2) *Learning to do*: acquiring and immediately applying specific skills and knowledge to an aspect of your job/role.

Motorola U

Launched 20 years ago, it was initially funded as a corporate overhead but now 47 per cent of funding comes from internal business customers, and 16 per cent from outside suppliers and customers. Motorola U has a staff of more than 300, with 600 external educators and lists 330 classes, 100 of which are available online.

Comprehensive e-learning solutions

The potential power of the Web is to create collaborative learning communities engaged in real time interaction. However, only a

minority of e-learning programs are living up to this potential. The challenge is to transform what can be a simple mechanical process into an exciting online classroom with powerful interactive features such as streaming media, personalised skill assessment, application and

simulation exercises, case studies, video clips, knowledge base access, expert communities, online mentoring, and discussion groups.

The characteristics of comprehensive e-learning solutions are included in Table I. E-learning companies, and the strategic

Table I Characteristics of a complete e-learning solution

Assessment and curriculum design and development	Organizational and individual needs assessment Setting competency standards of performance Goal setting and incentives Roadmap to educational success
Branded educational content	Proven, high quality intellectual capital Timely, relevant, and consistent information Keeping fast-changing content current, dynamic, and refreshed Off-the-shelf and customized
Broad and easy access to information	Anyone, anytime, anywhere, any subject Multiple technology-based delivery methods Synchronous and asynchronous Enabling just-in-time training
Engaging user experience	Rich multimedia experience Realistic simulations and role playing Video-based teaching and storytelling Advice and explanations from experts/mentors Animated case studies and examples Interactive games, activities, and music
Regular reinforcement	Personalized and/or real-time online mentors Web-casts, interviews, live events Practical exercises and application Facilitated workshops and discussion groups Desktop advice, special events, and updated learning opportunities Weekly newsletters and relevant articles
Collaborative online communities	Access to fellow learners, instructors, business leaders, and experts Access to system knowledge base Private company and global communities
Centralized tracking and administration	Easy and automatic knowledge management Tools to evaluate progress of individuals or groups Assessment metrics to pinpoint employee needs and goals Measuring return on investment
Scalable technology	Leveraging existing open industry standards Scalable to any size enterprise Flexible technology to include groups of workstations or the entire organization Easy integration with client's internal systems Delivering media rich broadband experience
Organizational consulting, implementation, and integration	Integration with existing curriculum and training delivery system HR and IT administration training Employee incentive and accreditation programs Performance reviews Cultural support for self-study Customized management training support Behavioural change measurement and reporting

Sources: Ninth House Network and W.R. Hambrecht & Co.

alliances they are part of are striving to enhance their performance in each of these characteristics including curriculum design, branded content, easy access, engaging users, regular reinforcement, collaborative online communities, centralised tracking, scalable technology, and integration with organisational activities. It is likely to be some years of further development before any company or consortium succeeds in putting all of these characteristics together in a meaningful way.

Conclusions

The corporate developments and strategic alliances in e-learning could produce a revolution in the way education and training is delivered in the knowledge-based economy, massively increasing the distribution of knowledge globally through the Web. Or e-learning could descend into the most company-specific forms of skill training, and through Disney and other entertainment companies become an offshoot of the infotainment industry.

In either case, the existence and vitality of traditional public universities and colleges will be even greater in the future than it was in the past, as the generators and transmitters of knowledge.

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