

From e-learning to e-knowledge

Jon Mason

education.au limited, Australia

jmason@educationau.edu.au

Reprinted from Chapter 26, in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London, with permission from Elsevier.

Abstract

There are numerous discourses associated with knowledge management but it is only in recent times that e-learning has been identified as a strategic resource that can be utilised in an increasing diversity of venues (home, workplace, cultural and entertainment venues, as well as traditional institutions of learning, education, and training). This chapter focuses on this issue and is concerned with three key ideas: the growing importance of e-learning as knowledge scaffolding; the emerging significance of knowledge management practice in informing strategic directions for the development of e-learning systems; and, a conceptual framework that brings together these first two ideas while also accommodating the proliferation and diversification of computational and communications environments.

Introduction

Stories that describe the evolution of e-learning could commence at any number of times and places; and they do. The story that is told here is one that ties together technical innovation, transformational practice, and the emergence of an 'interoperability standards agenda'. It is a story that can be told with a background context consisting of only a decade or so, and a story of the emergence of a new industry. The central argument that follows is that much of the infrastructure development that supports e-learning can be seen to be convergent with systems developed to support knowledge management. The more obvious examples include content management and workflow management. However, observing convergent trends is only the beginning. From a service perspective there are compelling grounds for *facilitating* this convergence.

But first, it is important to reveal some underlying assumptions. The first is that e-learning is no passing fad – instead, it is positioned to thrive in a multiplicity of settings (from formal to informal). Secondly, e-learning will continue to drive the transformation of traditional institutions of learning and help shape a number of futures – not just for the education and training sectors but across most industry sectors. Thirdly, it is argued that standards will play a pivotal role in shaping the Internet-enabled future of teaching and learning. This last key assumption is based upon the observation that the emergence of standards typically coincides with the early phases of new marketplaces, generally signalling consensus concerning key aspects of a new industry and maturity in innovation. In this sense, standardisation of technical components enabling e-learning is no different to standardisation of technical components that make aircraft fly. In addressing these issues this paper profiles some key standardisation groups and discusses the standards lifecycle.

Citation details:

Mason, J. (2005). 'From e-learning to e-knowledge', in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

So why is knowledge management important in this context? Put in its most basic form the answer is simple: learning and knowledge have a symbiotic relationship, they depend upon each other. From a slightly more complex perspective the creation, acquisition, transfer, and exchange of knowledge are all activities that are helping define the character of information- and knowledge-based economies – in which the primary assets of data, information, and knowledge all manifest digitally. The technological tools facilitating much of these interactions are information and communication technologies (ICT). And it is through engaging with ICT that learning defines itself as e-learning.

However, while knowledge is inextricably linked to data and information there is no simple, linear hierarchy and progression from data to information to knowledge. More accurately, there is a complex intermeshing and continuous transformation of digital bits in combination with a churning of insight, where meaning changes according to context and through conversations with different participants. In this sense, knowledge is organic and cannot be completely rendered in digital form. For Norris, Mason, Lefrere, Robson, and Collier this has warranted the use of a new term with broader reach: *e-knowledge* (Norris, Lefrere, and Mason, 2003; Norris, Mason, Robson, Lefrere, and Collier, 2003; Mason and Lefrere, 2003).

Stories of Convergence

Convergence of work and learning has been a hot topic for at least a decade. As a major trend and driver of change this convergence is taking place in the context of the ongoing digital revolution, a revolution that has enabled innovation and transformation in most settings associated with learning, education, training, and research, as well as their administrative and support services.

But convergence has also been a buzzword of the digital revolution itself, where telecommunications and computing capabilities have been integrated into the daily devices through which we engage with the world.

Over the last three to five years convergence can be seen to be taking place in the delivery of services. One of the clearest examples of this is in the development of e-government, where integrated service delivery has become paramount. Billions of dollars have already been spent worldwide on this effort.

In a similar way and more recently, services within the education and training sectors have been heavily influenced by the trends toward integrated service delivery as well as by portalisation and personalisation of information and services enabled through the Web. Moreover, the profoundly networked character of these new environments suggests that frameworks for service delivery will need to become increasingly flexible in their design.

There are, of course, many other stories of convergence – most notably in the publishing industry where the creator and the consumer are becoming increasingly ‘dis-intermediated’ and in the standardization world, where an increasing number of efforts are focused on similar challenges. But in terms of the main argument running through

Citation details:

Mason, J. (2005). ‘*From e-learning to e-knowledge*’, in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

this chapter it is *all* these stories of convergence that together are facilitating the meshing of e-learning with knowledge management.

e-Learning: from Cottage Industry to Maturing Marketplace

Despite the fledgling e-learning industry having been swept along by the boom and bust of the late twentieth century's dot com attempt at re-defining economics there is now ample evidence to indicate this new industry is maturing. With the enthusiastic adoption of e-learning by many HR departments within the corporate sector, e-learning is being commonly described as moving beyond its cottage industry phase (McLean, 2003). Moreover, it can be argued that the requisite infrastructure for this is only now being assembled.

The early investments in e-learning capability can be seen as primarily motivated by capturing market share – even by the most prestigious of institutions and consortia (e.g., Fathom) – with hindsight, can be understood as pre-emptive and hype-driven. Fathom's membership (Columbia University, The London School of Economics and Political Science, Cambridge University Press, The British Library, The New York Public Library, The University of Chicago, University of Michigan, American Film Institute, RAND, Woods Hole Oceanographic Institution, Victoria and Albert Museum, Science Museum, The Natural History Museum, The British Museum) also reveals that their shared endeavour was heavily *content-driven*. It is now becoming increasingly clear that 'content is king' can be seen as just another slogan from the late 20th century that no longer has the same appeal or applicability. After all, content only describes the 'I' of ICT; while the 'C' is more about connectedness, community, communications, context, processes, interactions, and engagement. Content may have been kin' at the peak of the *dot com* boom – epitomized by the merger of AOL and Time Warner – but this slogan has obscured the fact that *context* will always shape its usage. The failure of Fathom indicates its business model was designed with little understanding of sustaining online culture or appreciation that 'e' also stands for *engagement*.

As is well known, Fathom was not the only failure of e-learning's early promise. There's plenty of other prestige wreckage out there, as is well documented in an Australian Government report, the *Business of Borderless Education* (Ryan and Stedman, 2001). But while the gap between the early expectations of marketplace activity and actual reality is now obvious it is also true that investment in e-learning is entering another growth phase, characterised by strong activity in the corporate training market. For the university sector, however, this next phase is not without continued challenges as it tries to transform itself in order to remain viable and competitive. A good example is the lead time involved in launching U21 Global, the 'virtual university' spin-off of Universitas 21, which blew out to well over 12 months behind its anticipated launch.

However, one of the key lessons to be learned from the early heady days of the dot com boom is that failed or un-proven business models do not necessarily equate with any failure of e-learning as a driver of change. To the contrary. When John Chambers, CEO of Cisco Systems, claimed at the 1999 COMDEX conference that education on the Internet was set to become the "next killer app" and that it would make "email usage look

Citation details:

Mason, J. (2005). 'From e-learning to e-knowledge', in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

like a rounding error” he wasn’t just being provocative! Hype, yes – but there’s a fair chance he was being visionary and that this may yet come to pass. Among the reasons why – to underscore the earlier argument – is that knowledge-based economies are driven by a free flow and intermeshing of data, information, and knowledge, where value is created from an ever-increasing reservoir of abundance. In such circumstances where resources are themselves not scarce *value* must be created in novel ways. Thus, key competencies in exploring the frontiers will most likely leverage learning and knowledge sharing. It therefore stands to reason that Web applications supporting these activities will themselves be driven by new innovations. Getting an edge in a knowledge-based economy will bring a whole new meaning to the gathering of ‘market intelligence’. And as knowledge-based economies begin to develop depth the principle of value creation will consolidate as a fundamental metric of success.

Among the many factors contributing to the development of the e-learning marketplace is the standards movement, a movement involving many stakeholders from industries other than education and training. But before telling the standards story in more detail it is worth setting the scene with an historical look at the depth of the foundations for the e-learning industry. What’s in a name? It would seem there is quite a lot. One of the indicators of maturation can be seen in the stickiness of the term ‘e-learning’. In the decade prior to this new lingo there had been a profusion of terminology associated with educational technology and technology based training – such as computer-based training (CBT), computer-managed instruction (CMI), computer-managed learning (CML), computer-mediated communication (CMC), interactive multimedia, hypermedia, online learning, online learning environments, learning technologies, virtual learning environments, virtual education, and the often misused ‘distance education’ and ‘distance learning’. This is not to argue that ‘e-learning’ will continue to stick (as other terminology such as ‘blended learning’ gain acceptance) but what is clear is that the corporate world now owns this terminology as much as the traditional education and training sectors. There’s probably a range of reasons for this but Stan Davis and Jim Botkin articulated some useful perspective nearly a decade ago:

“If you are not being educated in your job today, you may be out of a job tomorrow ... Employee education is not growing 100 percent faster than academia, but 100 times – or 10,000 percent – faster ... Over the next few decades the private sector will eclipse the public sector and become the major institution responsible for learning.” (Davis and Botkin, 1994)

Supporting such grand predictions are ample statistics to indicate that e-learning is indeed set to thrive in corporate settings at a pace that will not be matched in traditional educational settings (Obstfield, 2002). The corporate sector can see this change unfold. E-learning is therefore developing as crucial scaffolding for knowledge-based economies.

Standards Develop as Markets Mature

The growth of e-learning now underway gains further significance when considering the role and outputs of the various standardization groups. There are in fact a large number of these groups engaged in standardization, all of which are helping forge a vibrant and

Citation details:

Mason, J. (2005). ‘*From e-learning to e-knowledge*’, in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

sustainable e-learning infrastructure. And these groups are not just associated directly with the mainstream e-learning industry – they are also associated with e-business, knowledge management, and organisational development. It is not the intention here to elaborate in any detail about these groups as there are numerous accounts that already deal with this theme (Hodgins, 2003; Collier and Robson, 2002; Norris, Mason, and Lefrere, 2003: 84-85). However, there are three key points that are worth making that provide further context in the emergence of e-knowledge.

Firstly, while the early years (1997-2000) of the ‘learning technology’ standardization effort seem to have been met with only lukewarm or spasmodic responses by many ‘natural’ stakeholders (such as e-learning practitioners within traditional institutions of education and training) the fact remains that standards (that apply to any industry) generally develop in the early growth phases of those industries. This lukewarm response was often motivated by a distrust of the big IT corporates and by a perception that standards lead to regulation and thwart innovation. Over the past few years such views have been giving way to enthusiastic engagement, much of which is being supported by government-funded ‘interoperability standards’ initiatives (prominent examples include Curriculum Online in the United Kingdom and The Learning Federation in Australia). The growing internationalisation of the e-learning standardization movement is also indicative of the industry maturing, facilitated largely through the efforts of groups such as the IMS Global Learning Consortium, the IEEE Learning Technology Standards Committee, and CEN/ISSS WS-LT (the committee leading learning technology standardization in Europe).

Secondly, innovation is being stimulated by the development of these standards. Once the basic specifications are in place and can be referenced as stable documents then innovations typically flourish. In the case of e-learning, the first area of development has been focused on modular content development (through ‘learning objects’) and content description, packaging and exchange formats. Such developments have facilitated the seamless communication between digital content repositories and managed e-learning environments providing end-users with the experience of working within an integrated environment.

Thirdly, the Internet revolution would have been impossible without standards such as TCP/IP, HTTP, HTML, and more recently, XML. Where the ongoing evolution of Internet infrastructure is concerned three key areas of standards development can be identified as providing the foundations for the emerging e-knowledge industry:

- Web Services and service-oriented architectures – these will facilitate development of common services that support a broad range of industry sectors.
- Next generation Internet technologies such as high bandwidth Internet2 applications, the Semantic Web, and Grid computing.
- Standards facilitating e-learning and knowledge management.

Citation details:

Mason, J. (2005). ‘*From e-learning to e-knowledge*’, in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

Finally, standardization efforts in fields of e-business, human resource development, and knowledge management have also been underway for a number of years. Groups such as the Workflow Management Coalition, the HR-XML Consortium, OASIS (Organization for the Advancement of Structured Information Standards), and GKEC (the Global Knowledge Economics Council) are all contributing to developing robust infrastructures and processes. These developments all describe yet another story of convergence. They also underscore the widening scope of knowledge and processes that can be meshed with the aid of ICT-enabled infrastructures.

Pervasive ICT

Whether it is ‘ubiquitous computing’, ‘pervasive computing’, ‘intelligent environments’, ‘ambient technology’, or some other descriptor there is a range of terminology that now describes the ever-increasing presence of ICT-enabled environments and innovations in mobile communications. ‘Any time’, ‘any where’, and ‘any how’ become the everyday descriptors for e-interactions whether they are wired or wireless. The proliferation of mobile computing and communications devices and the development of networks connecting new objects such as home appliances and security systems, transport, workplace, entertainment venues, and even the nursing home, all point to the stimulation of all our modalities in making sense of the world and in developing effective skill-sets in dealing with it.

Learning, then, is not only a lifelong requirement: its scope and character are also changing. ‘Digital literacy’ is changing the basics of the so-called “three ‘r’s” and is itself a term that will demand ongoing reassessment, particularly in learning contexts. The ubiquitous nature of digital technology is also shaping game-based learning, and defining the primary learning mode for “digital natives” – as Prensky has been arguing for some years (Prensky, 2001). The saturation of our environment with digital technology and networked connections therefore also extends the tools through which we create, acquire, share, and manage our knowledge.

Reflections on the Dimensions of Knowledge

Reflecting on the nature of knowledge is not just a philosophical pursuit. It can be integral to the way we make sense of the world (Dervin, 1998). It will increasingly become a routine competency of professionals sustained by knowledge-based economies. And for anyone whose career is associated with professional education or training it becomes a first principle in organizing information.

‘Knowledge’ is a word that has rich semantics despite its linguistic status as a noun. And it is common sense that knowledge is much more than a ‘thing’ and subject to continual change, in the same way as consciousness changes from moment to moment. In the highly networked digital domain this is no different. ‘Content’ is both a static resource and something that can flow through networks manifesting itself in endless ways – as documents, audio, video, animations, communications, financial data, transactional data, etc. Just like knowledge and beauty, content is in the eye of the beholder; or, in other words, one person’s knowledge is another person’s data. Most certainly, though, digital content finds expression as data, information, and knowledge.

Citation details:

Mason, J. (2005). ‘*From e-learning to e-knowledge*’, in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

In an attempt to develop a framework in which the above discussion can be made more coherent the model presented in Figure I portrays key facets or dimensions of knowing. Thus, 'know-who', for example, has a very different quality to 'know-what' or 'know-how'. Unless one 'knows-why', in some circumstances, the effectiveness of accomplishing an act dependent upon rationale for doing so is likely to be questionable. Likewise, without a sense of 'know-where' (from and to) or 'know-when' there's not much strategy in any planning. And the practice of developing contingency plans through foresight planning rests largely upon a capacity to 'know-if'.

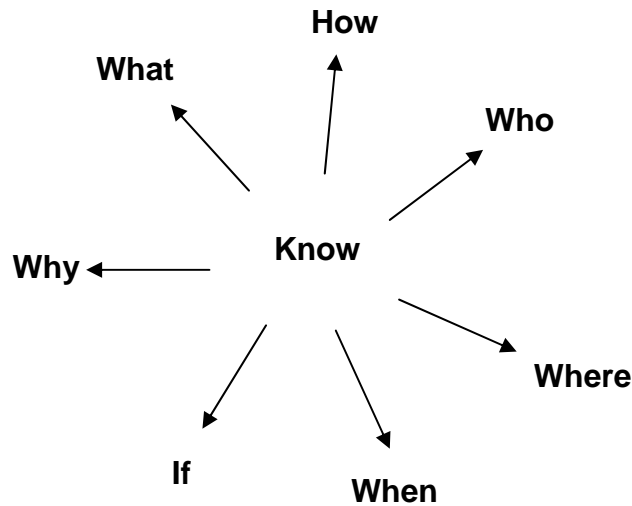


Figure I

Table I provides further explanation:

Knowledge Facet	Description
Know What	The object of knowledge – e.g., knowledge management, the Internet, information systems, marine science, economics, ...
Know Who	Relationships, networks, connections, authorities, institutions, individuals, collaboration, associations, clubs
Know How	Skill, networking, consulting, collaborating, sharing, researching, reflecting, developing, testing, maintaining, doing, innovating, managing
Know Why	Rationale, context, business planning, strategy, reasons, explanations
Know Where	Location, where-to, where-from, strategic positioning, planning, reflecting, navigating
Know When	Just-in-time, timing, pacing, planning, scheduling, context, the past, the future
Know If	Just-in-case, scenarios, scenario development, foresight, futures, contingency

Table I

Citation details:

Mason, J. (2005). 'From e-learning to e-knowledge', in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

Most importantly, as we develop better models to support future e-learning and knowledge management systems we will need to better leverage something that is core to the way we learn and develop knowledge: our own experience. For, as one educationist argues:

“A crucial but often unrecognised dimension of learning is the capacity to make use of prior experience as well as emerging experience in new situations. With traditional methods of evaluating learning, we cannot discover just how a learner's prior experience might be brought to bear to help scaffold new understandings, or how ongoing experience shapes the content knowledge or skills and strategies the learner is developing.” (Syrverson, 2003)

Such perspective is only present in very rudimentary ways in the e-learning and performance support systems that are currently available. This will no doubt change, for as Norris has recently argued the very nature of our “experience of knowledge” is changing in much the same way as the scope and character of learning are being extended (Norris, 2002). “E-knowledge” is one attempt to describe this richer experience.

In Practical Terms

With a view to the practical implications of the foregoing discussion the following prompts may be useful in determining appropriate action:

1. **Know-What.** Not just your field of expertise but also how it relates to the world of ‘e’, where ‘e-anything’ now signifies engagement with technologies that are transforming most industry sectors – from business process to learning, training, and knowledge management. *What skills are needed?*
2. **Know-Who.** We live within a profoundly networked world. Questions such as “*who do you know who...?*” are important keys to unlocking connections and building networks.
3. **Know-How.** As knowledge-based economies grow key skill-sets associated with knowledge sharing will shape business process and help identify the sources of value. *Do you know how to harness the ‘e-tools’ effectively?* Know-how is also about translating and applying knowledge into effective action. *Do you participate in organisational storytelling as a means of knowledge transfer and organisational learning?*
4. **Know-When.** This perennial concern is both a strategic and an operational consideration – but not just for management.
5. **Know-Why.** Understanding *why* provides clarity and direction. Without such clarity company mission statements and strategic goals become meaningless.
6. **Know-Where.** Do you know where to find the information, tools, or expertise you need? Where within your organisation and where beyond it? Questions of where are also to do with trajectory (where from and where to) – strategic planning is shaky without clarity on this.

Citation details:

Mason, J. (2005). ‘*From e-learning to e-knowledge*’, in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London

7. **Know-If.** Once upon a time ... Through storytelling and scenario development new dimensions to environmental scanning can be discovered. And readiness for the unexpected!

Summing Up

The title for this chapter indicates a progression from e-learning to e-knowledge. However, this relationship is not a simple or linear history. The preceding discussion has focused on the development of e-learning as knowledge scaffolding while also indicating a convergence of knowledge-based systems with e-learning systems. These trends are only just beginning. They are based on observations and practice and are not offered as fixed predictions. The world we live in and the worlds we share are always conditioned by uncertainties. Knowledge is conditional as is learning – both can be said to be complex adaptive systems. On this last point, John Seely Brown asks a key question:

“What do we know that we didn’t know ten years ago? That learning and knowledge are the result of multiple, intertwining forces: *content, context, and community.*” (Seely Brown, in Ruggles, & Holtshouse, 1999, p. ix)

References

- Collier, G., & Robson, R. (2002). eLearning Interoperability Standards, USA: Sun Microsystems White Paper.
- Davis, S., & Botkin, J. (1994). *The Monster Under the Bed*, USA: Simon and Schuster.
- Dervin, B. (1998). Sense-Making Theory and Practice: An Overview of User Interests in Knowledge Seeking and Use, *Journal of Knowledge Management*, Vol 2(2).
- Hodgins, W. (2003). Information about all the Learning Standards being Developed, www.learnativity.com/standards.html
- Mason, J., & Lefrere, P. (2003). Trust, Collaboration, and Organisational Transformation, *Proceedings, E-learn International 2003*, International Journal of Training and Development, Edinburgh.
- McLean, N. (2003). Towards global e-learning standards for interoperability, *Initiatives 2003: Academics and Standardization*, Versailles, France March 2003. www.initiatives.refer.org/Initiatives-2003/_notes/_notes/resumneil.htm
- Norris, D. (2002). Changing How We Experience Knowledge www.strategicinitiatives.com
- Norris, D. Mason, J., & Lefrere, P. (2003). *Transforming E-Knowledge*, Ann Arbor: Society for College and University Planning.

Citation details:

Mason, J. (2005). ‘From e-learning to e-knowledge’, in Madanmohan Rao (ed.) *Knowledge Management Tools and Techniques*, pp. 320-328. Elsevier, London

Norris, D., Mason, J., Robson, R., Lefrere, P., & Collier, G. (2003). A Revolution in Knowledge Sharing, EduCause Review September, Vol 38 (5) pp.14-26, USA.
www.educause.edu/ir/library/pdf/erm0350.pdf

Obstfeld, M. (2002). E-Learning is where the money is at – new reports, EuropeMedia
www.europemedia.net/shownews.asp?ArticleID=13031

Prensky, M. (2001). Digital Game-Based Learning, USA: McGraw-Hill

Robson, R., Norris, D., Lefrere, P., Collier, G., & Mason, J. (2003). Share and Share Alike: The E-Knowledge Transformation Comes to Campus, EduCause Review Online
www.educause.edu/ir/library/pdf/erm0351.pdf

Ruggles, R. & Holtshouse, D. (eds.) (1999). The Knowledge Advantage: 14 Visionaries Speak on Leveraging Knowledge for Marketplace Success, Dover, USA: Capstone

Ryan, Y. & Stedman, L. (2001). The Business of Borderless Education – 2001 Update, Canberra: Department of Education, Science, and Training.
www.dest.gov.au/highered/eippubs/eip02_1/eip02_1.pdf

Rylatt, A. (2003). Winning the Knowledge Game – A smarter strategy for better business in Australia and New Zealand, McGraw-Hill, Sydney.

Syrverson, P. (2003). The Five Dimensions
www.cwrl.utexas.edu/~syverson/olr/dimensions.html

Citation details:

Mason, J. (2005). 'From e-learning to e-knowledge', in Madanmohan Rao (ed.) Knowledge Management Tools and Techniques, pp. 320-328. Elsevier, London