

A Learning Environment Maturity Model: Optimising Learning and Performance Systems Strategy

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Abstract

A Learning Environment Maturity Model (LEMM) is a necessary tool for optimising any organisation's learning and performance systems strategy. Many current learning architectures and supporting systems are still predicated on pre-Web models which take little account of, or can gain little benefit from, the opportunities that digital technologies and rapidly changing socio-cultural trends can offer. In the evolution of organisational learning the next challenge is the design and implementation of interactive learning environments that will replace the current outdated passive and transaction-based, one-size-fits-all, learning systems and support the future autonomous learners that the modern organisation desires.

Historical background

The competitive strategy of organisations around the world shows a history of evolution. Through the Industrial Age it centred around access to resources, processes and markets. Now in the Information Age it can be argued that the competitive landscape is centred around people. Getting the right people, providing an environment for them to excel and nurturing their talent are all strategies many would now consider as necessary for success (Drucker, 2000; Collins, 2001; Pfeffer & Sutton, 2006).

If nurturing people is an important organisational strategy one would expect that organisations would have a sophisticated and comprehensive, systems-based, learning and performance strategy to support this business need. Unfortunately any survey of national or international companies shows that this is rarely the case. The majority of organisational learning and performance systems strategies are still predicated upon the Industrial Age notion of training as a cost (of goods and services) rather than the Information Age need for learning as an investment (in ideas and people).

Systems-based Learning and Performance Architectures

To attract and retain the so called 'talent' which an effective organisation requires needs a comprehensive learning and performance architecture based upon both intrinsic and extrinsic reward systems, a careful blend of technology and presence and a close alignment with business strategy. Examples of such architectures, in our experience, are rare. Most architectures are a cacophony of reward systems, learning models, technology trends and a number of often uncoordinated learning programs based upon varying foci such as cost, skills, processes, intangibles like leadership, behaviours or competencies etc.

The advantages of a coordinated systems-based learning and performance architecture could be many. Yet we know that business operations require skill and task-based learning, business improvement requires goal-based learning and business transformation or personal development requires aspirational learning to develop the autonomous learner (McKey & Ellis, 2007a). So how do we go about designing and developing an inclusive systems-based architecture that would work effectively at all levels of the organisation for all needs?

McKey and Ellis (2007a) have outlined a Learning Environment Maturity Model (LEMM) (Figure 1) that seeks to demonstrate how such a learning and performance architecture can be built. The model shows an organisational systems-based learning architecture based upon the dual variables of increasing sophistication and increasing personalisation which gives us five stages (from least to most) – passive, transaction-based, interaction-based, experiential and autonomous learning.

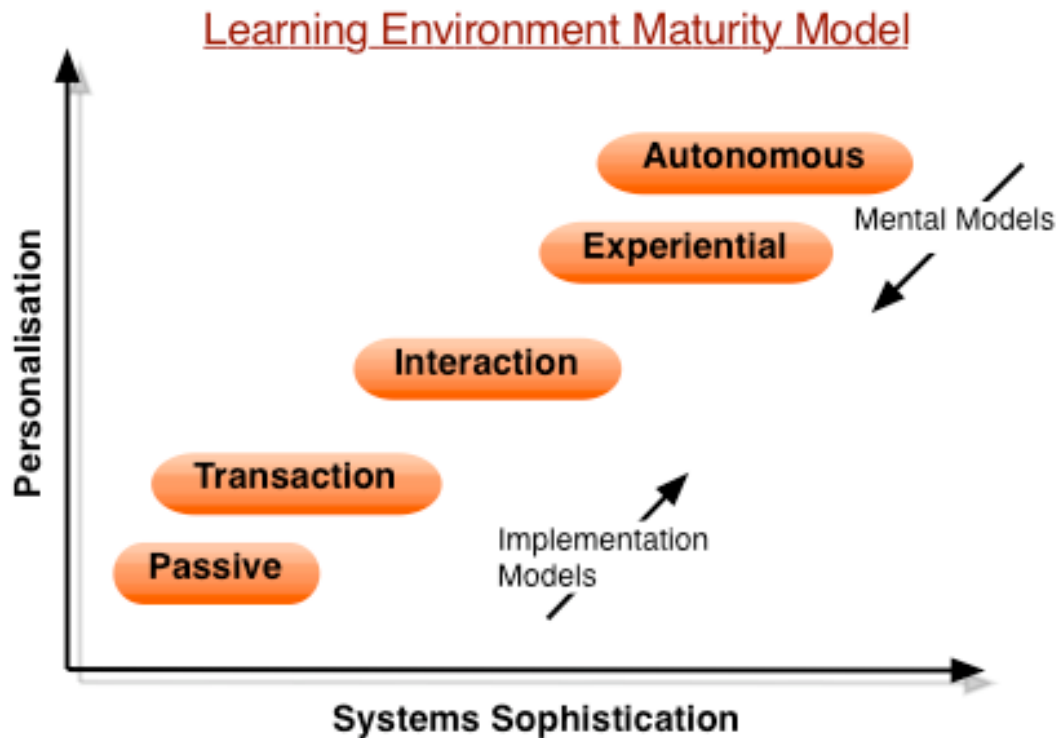


Figure 1 – Learning Environment Maturity Model (LEMM) (McKey & Ellis, 2007a)

The LEMM focuses on the learning environment as the principal vehicle to demonstrate progression of the organisational learning architecture since it encompasses all of “the technology and systems, the implementation, instructional and learning methods, the business needs and the learner’s preferences, skills and desires” (McKey & Ellis, 2007a) While the term learning environment is a catch-all phrase it is unique to each organisation and contains all the available variables that will hinder or support learning. Since it is not based on technology, curriculum or competencies alone it allows a holistic yet customisable view and one that can align better with strategy. The five stages are generic guidepost terms yet each organisation will build unique variations of these common benchmarks.

“The autonomous learner is the goal of this model. Organisations increasingly want staff who can evaluate, research and solve problems themselves. The entrepreneurial and opportunistic nature of modern organisations requires some staff who can operate quickly and instinctively. Sophisticated system support manipulating extensive knowledge networks is critical for their success. The traditional lag of formal learning is too long. Plus these should be highly personal systems allowing full control, customisation and privacy.” (McKey & Ellis, 2007a)

Designing a Learning Architecture

Before setting out to design and develop an organisational learning and performance architecture there are a number of critical questions to answer. The fundamental question is what is your organisation's *modus operandi* and strategic use of learning?

What the LEMM shows is that the learning environments at either end of the model are almost mutually exclusive or diametrically opposed. They serve different purposes for different audiences. Passive and transaction learning methods such as lecture, instructor lead and most online or distance learning, dominate in organisations (or that part of the organisation) focussed on operations where skills, systems and compliance training are critical. Organisations invest heavily in processes, systems and training resources to support these bottom two layers of the LEMM.

Organisations that require critical and strategic thinking, creativity or unique problem solving capabilities need autonomous learners. These are people who have developed independent learning skills and expertise through extended education and experience. They require free access to all the layers below them – passive to experiential - to support their current task or development focus. 'Smart' firms are using more interactive and experiential learning to support this mode.

While it is acknowledged that autonomous learners are different, organisations still tend to utilise many of the same techniques, delivery methods and learning environments for the independent learners, as they do for operations staff. This is despite evidence that this approach is both unsuitable and ultimately ineffective (Jonassen,2003). This is done because we want some return on that investment mentioned above and because we know little of how autonomous learners operate. Unfortunately a typical Learning Content Management System (LCMS) developed for low cost, transaction-based 'read and regurgitate' compliance training is a poor fit for an experiential or autonomous learning need.

For the majority, particularly management, who tend to have little knowledge of adult learning principles, this is considered appropriate. The irony is that in kindergarten we employ techniques more associated with autonomous and experiential learning methods before moving children on to primary and secondary education that emphasise passive and transaction-based learning techniques. It is not until we get to the very end of high school or university that we again get to partake in interactive learning environments.

In addition the structuring of a typical organization into its component perspectives of business, purpose, technology and people also suggests that different systems may be required to support different functions since their ways and means can be unique (McKey, 2006). So the fundamental question remains, how does the organisation use learning to support its strategy and provide competitive advantage?

Process versus Practice

Seely, Brown and Duguid (2000) state that during the 1990's our organizations' search for competitive advantage was driven by two competing ideologies – one process driven, the other knowledge driven. The former championed by the reengineering camp, the latter by the proponents of knowledge management.

“Reengineering and knowledge management are profoundly different approaches... Reengineering is about the structured coordination of people and information. It's top-down. It assumes that organizations compete in a predictable environment. Knowledge management focuses on effectiveness more than efficiency. It's bottom-up. It assumes that managers can best foster knowledge by responding to the inventive, improvisational ways people actually get things done. It assumes that value-creating activities are not easy to pin down. And it assumes that organizations compete in an unpredictable environment.” (Seely, Brown & Duguid, 2000, p.47)

This major strategic difference in approach, between process and practice spills over into learning and performance. Structured coordination of people and information are best served by passive and transaction-based learning systems. Inventive and improvisational methods require interactive and experiential learning systems.

Industrialisation of Learning Systems

While re-engineering and knowledge management may be profoundly different that does not mean they are mutually exclusive and in fact could and should coexist quite nicely within one organisation. To exclude one ideology for the other would be doing yourself a disservice. In addition we can show that they have more in common than first appears.

In most organizations the process or operational approach dominates as it provides security and consistency in risk averse conservative organizations. Even “writers about knowledge management and learning objects explicitly use the terminology associated with industrialization.” (Downes, 2001) That is possibly because it is a primary motive of the knowledge management camp to encode knowledge to allow its processing and distribution and then to decode it at the point of use. Hence in both cases, reengineering and knowledge management are ultimately ‘engineered’ solutions. This is their common ground.

So even knowledge management has been captured by the industrialized re-engineering processes. However the culture of industrialization in corporations could be ultimately defeating in anything other than very stable, mature and process driven industry sectors. (Hansen et al, 1999). The point is again emphasised in the following:

“...this chapter explains why knowledge management systems (KMS) fail and how risk of such failures may be minimized. The key thesis is that *enablers* of KMS designed for the 'knowledge factory' engineering paradigm often unravel and become *constraints* in adapting and evolving such systems for business environments characterized by high uncertainty and radical discontinuous change.” (Malhotra, 2004)

The Holy Grail is to match the knowledge to the context through methods such as decision support systems, artificial intelligence and just-in-time learning. That is where humans come in. The other continuum in our maturity model moves from systems to personalisation. Humans, at this point in time, are still by far the best at applying knowledge to context and vice versa. Who can say if or when that may change and in some areas such as the predictive sciences (weather, economics, bioinformatics etc.) maybe it already has. The question is that in a competitive environment is this the best option?

“Organizational controls tend to *ensure* conformity by enforcing task definition, measurement and control, yet they may *inhibit* creativity and initiative. Enforcement of such controls is essentially a negative activity since it defines "what cannot be done" (Stout 1980) and reinforces a process of single loop learning with its primary emphasis on error avoidance”. (Argyris 1994).

Codification or Personalisation?

The re-engineering ‘fad’ has come and gone and organizations still seek competitive advantage through some technological, process or an environment shifting windfall. Many believe that in highly competitive sectors people are the last frontier, and giving them the systems, support, confidence and permission to innovate will be critical for success.

“Argyris (1990) has referred to the transition from traditional external control mechanisms to the paradigm of self-control as "the current revolution in management theory." (Malhotra, 2004)

The LEMM has a lot in common with a knowledge management approach as it ultimately supports continual innovation in addition to operational learning needs. Yet even knowledge management has distinct methods and purposes. Hansen et al (1999) describe two approaches large consulting firms take to managing their knowledge which is also the foundation of their business strategy. Some firms, such as Ernst and Young, use codification and reuse by investing heavily in IT to build a people-to-documents model. Their strategy is process efficiency, speed and lower overall cost through applying tried solutions to known problems. Others such as McKinsey & Co. and Bain & Co. take the personalisation approach and invest heavily in people and expertise to build a people-to-people model. Their strategy is applying

practice, customisation, sharing of tacit knowledge and an ability to cope with ambiguity which is necessary for strategy consulting.

Process versus Practice

While the above approaches are distinct in almost every organisation they pose a practical dilemma and that is “the organizational tension between process, the way matters are formally organized, and practice, the ways things actually get done.” (Seely, Brown & Duguid, 2000, p.47)

Consider the insurance industry. This is an industry that relies heavily upon process and the codification of knowledge that allows actuaries to make risk assessments of future events and so price insurance products. The Insurers part of the business must be rigid to provide consistency and to lower operational risk. It uses passive and transaction-based learning environments to deliver competence-based training to all staff and distributors as required by government. Now consider the actual sales consultants, seeking new opportunities, customising products and working with clients by helping them structure their insurance around their business needs. Their practice is usually unique and personal. These are the autonomous learners who drive the organization sales via relationships, experience and deep product and business knowledge. Their use of, and need for, learning environments (after they have progressed their careers) is almost totally interaction-based and experiential, that is, they no longer need knowledge transfer but now require knowledge support.

For consulting firms who are knowledge centric or insurance firms who are process centric which of these approaches dominates is a strategic question and both are still required. For the bulk of organizations the key question is, how does knowledge that resides in the company add value for the customer? Is it in products and services, process, culture, stored data or in people’s heads, relationships and experience? Possibly all. “Process and practice, then, do not represent rival views of the organization. Rather, they reflect the creative tension at the centre of innovative organizations.” (Seely, Brown & Duguid, 2000)

The design and development of learning environments must acknowledge and support this creative tension that provides the innovation at the heart of any successful organisation. A maturity model can help clarify and guide strategy, investment and activity of corporate learning and performance support. (McKey & Ellis, 2007a)

The shift to Interaction

The lower two stages (Figure 1) of a LEMM are process driven and follow an implementation model designed for quantity. This has been where the bulk of systems-based learning has occurred. This is necessary and sufficient for many large scale operational organisations. The top two stages (Figure 1) of a LEMM are practice centric and follow mental models designed for quality. Systems support for experiential (ie simulation) and autonomous learning environments can be expensive. Yet this old divide between technology driven investment or people driven investment was mainly an economic decision which forced organisations to either end of the spectrum. That divide has gone. Modern organisations must invest in information and communication technology to operate with quantity and quality knowledge. How much they then also invest in sophisticated knowledge-management systems and integrated learning environments is the current strategic question.

The passive and transaction-based corporate learning environments have been predicated upon a number of key influences which are shifting. These include: “command and control managerial models shifting to an organization of knowledge specialists” (Drucker, 1998,p19); authoritative teaching and information models shifting to user-generated content, collaboration and problem-based learning; centralised broadcast technologies shifting to peer-to-peer networks; people shifting from passive consumers to active consumers; and finally mandated supply driven just-in-case education shifting to demand driven just-in-time skills and lifelong learning. (McKey,1999; Bates, 2000)

The above shifts have been occurring for some time. Many could be attributed to the influence of post-modernism. Howell et al (2003) quotes Alvin Toffler “The illiterate of the 21st century will not be those

who can't read and write. They will be those who can't learn, unlearn, and relearn" and describes 32 trends affecting distance education. In addition all sectors of society have been experiencing high degrees of innovation, competition and rapidly changing socio-cultural trends which put pressure on organisations to find new and better ways to support staff communications styles and learning requirements. For example, Jonassen (2004) has suggested Problem-Based Learning (PBL) "may be the most significant pedagogical innovation in the history of education" and points out that "in professional contexts, people are paid to solve problems, not to complete exams." (Jonassen, 2004 p.xxi).

Convergence leads to Independence

Many of these shifts and trends will both define and be defined by the central stage of the LEMM (Figure 1) represented by interaction-based learning environments. This stage, the meeting point of process and practice, will grow to dominate organisational learning and knowledge management for the foreseeable future.

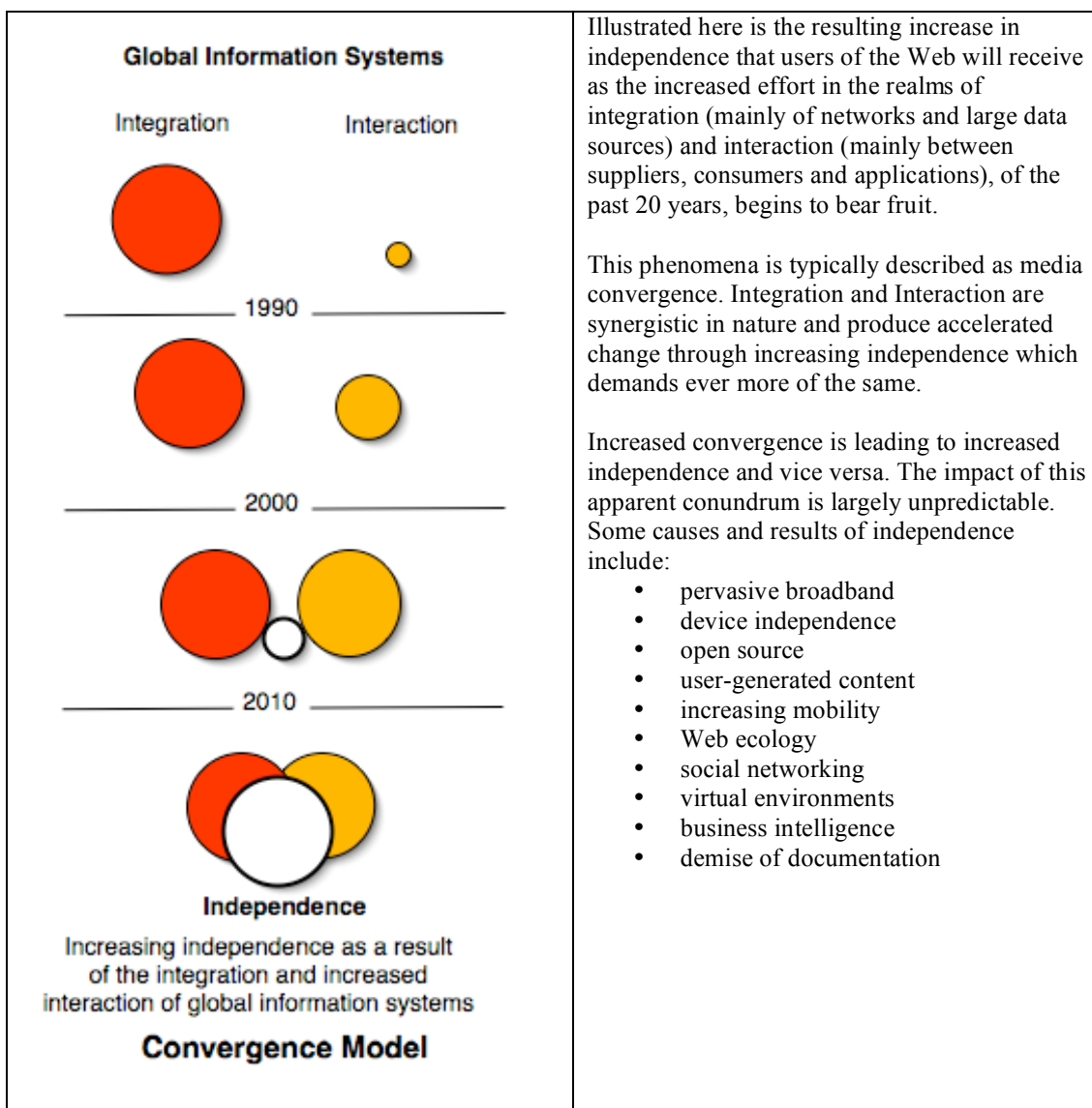


Figure 2 – The Convergence Model shows that increasing integration and interaction will lead to accelerated independence for Web users. (McKey & Ellis 2007b)

In addition, the convergence model (Figure2) is forcing organisations to merge and evolve their business intelligence and their learning systems to be less transaction-based and more personal and interactive. Interaction, as humans practice it, requires mutual adaptation, not one-way flows of knowledge hegemony. Interaction-based learning environments are an intermediate stage between the fairly rigid transaction-based environments and the expressive experiential environments. They will evolve around enabling technologies and produce phenomena like virtual worlds, such as Second Life (<http://secondlife.com>), and social networking systems such as FaceBook (<http://www.facebook.com>) or Bebo (<http://www.bebo.com>). They are founded on the integration of the large scale information and communication networks of the past thirty years and the semantic web technologies of the past few years. Their success is based upon ubiquitous access to individuals and places, private peer to peer interaction without interference by any governing authority, and the only rule being to adhere to socially acceptable behaviour.

A Mindmap of the Interaction Stage

Figure 3 shows a mindmap of some the emerging elements interactive learning environments will make use of to build large scale, geographically diverse, learning networks. Note they include both enabling technologies and social and economic phenomena because these are rapidly converging.



Figure3 – Web 2.0 Mindmap of Memes (Angermeier, 2005)

If learning environments based upon ubiquitous interaction become critical to innovation and the provision of competitive advantage, particularly in knowledge-based industry sectors, then their implementation will spread quickly.

However even more disruption to existing command and control models will take place: unlike previous systems-based learning environments, where technology dominated, usability and social patterns will dominate their design; these systems' power lies in the building of networks outside the organisation as well as inside; they will need to be community-based to be effective; pedagogy will need to adapt from purely authoritative to community knowledge (<http://www.wikipedia.org/>); they will utilise trust systems in addition to secure systems (<http://www.ebay.com>); they will share knowledge via open licences such as creative commons (<http://creativecommons.org/>); because the semantic web is self-referencing this will force a change from designing 'telling' systems to designing 'asking' systems, which support attitude change through double-loop learning and so enable continuous improvement.

Conclusions

The challenges for designing, building and utilising next generation interactive learning systems as described in the proposed LEMM, are many. While much is being written about the usage of individual semantic Web elements in teaching and learning nearly all are based upon the addition of these elements to existing transaction-based systems based mainly on course management systems. Most higher education institutes will be obliged to utilise their course-based business model and existing supporting infrastructure and so the add-on method will dominate as teachers try to integrate new trends into legacy systems. It will be a slow and ad hoc approach. And possibly futile since both the business model and infrastructure are redundant in a demand driven, community-centric learning environment.

Many corporations (and those truly entrepreneurial educational institutes) will take a more radical approach as they realise the potential for competitive advantage by shifting to being a knowledge-based organisation. They will want to architect all new systems which are distinct and future focussed, yet still utilise, their legacy systems.

This paper sets the foundation thinking for these emerging independent, systems-based, interactive learning environments that could dominate corporate learning for many years to come. Yet how do we go about designing or even modelling such systems? These systems will not be based upon the individual vendor's monolithic applications of the past but an integrated system of component technologies from partner consortia, emerging business models and yet unknown community-driven rules. This alone will radically change the way these systems are designed and built. Only through a concerted approach of considering the synergies between the business, purpose, technology and the people needs and desires of a modern organisation would a truly responsive, adaptive and interactive system be built. (McKey, 1999)

The growth of interactive learning environments will be organic and hence difficult to manage. This is both their risk and opportunity. Those organisations who have the courage to embrace these new ways of learning will bridge the divide between process and practice and provide the next generation learners with systems that reflect both their individual desire to be, and the organisational need for, autonomous learners.

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