



International Business Improvement Consultants

A Maturity Model for Corporate Learning Environments

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Abstract

Models abound in learning and development yet few have addressed the need for a maturity model for corporate learning that specifically describes the unique methods and designs that can deliver competitive advantage through learning and performance. Such a model is required to align perspectives and inform investment, design, development and implementation of learning environments in organisations of all types and size.

A five stage maturity model focussing on corporate learning environments is proposed. This model is designed to allow all perspectives of an organization to be used to understand and visualise their organisation's learning capability, synergy and performance. The model describes the rationale for and development of a progression from passive to transaction, then to interactive learning environments, through to

experiential and finally to autonomous learning environments.

Model Building

"Models are powerful tools for representing complex structures and relationships for the purpose of better understanding or visualising them." (Cooper & Reimann, 2003, p55)

Conceptual frameworks and taxonomies abound in education and psychology with some reaching almost universal recognition within the sector, such as Bloom's "Taxonomy of Knowledge" (Bloom, 1956) or Maslow's "Hierarchy of Needs" (Maslow, 1968). The model proposed here however, may be more correctly regarded as an ontology. An ontology describes attributes and relations of a particular knowledge domain and is therefore more robust than the typical hierarchical taxonomy.

Crampton-Smith and Tabor (1996) describe five activities of interaction

design – understanding, abstracting, structuring, representing and detailing. These five activities would ultimately lead to an interaction model of a particular domain under investigation.

Figure 1 – The Interaction Levels of an Online Learning System (From McKey, 1997) As back-end sophistication and capability increase there should be a commensurate increase in front-end simplicity.

Level	Front End	Back End
Passive Publishing	Read Only access. Static web pages. (They may be dynamically published but from the client's perspective they are static).	No activity.
Active Publishing	As above + Read-Write access. Static to dynamic web pages incorporating some 'push' technologies to personalise for different classes of clients.	Forms are used in data-gathering mode. Search engine. Mainly manual or semi-automated manipulation of gathered data.
Semi-Interactive Publishing	Read-Write-Limited Change access including searching. The main feature of this level is that applications beyond the Web server are utilised.	Forms are interactive with a DBMS. Change access is only available to non-critical elements. Mainly automated manipulation of gathered data.
Fully-Interactive Publishing	This is where web commerce or verified course enrolment and timetabling occurs. Student modelling and expert systems could be added here.	This sort of access is required to manipulate or update schedules, orders etc. Change access is given to critical elements. Fully automated.

The model in Figure 1 (McKey, 1997) followed the 'publishing' perspective that was popular in the early days of the World Wide Web (Web). The page metaphor was the common mental model used to explain Web sites. Hence first attempts at a progressive maturity model followed this dominant publishing theme. Increased interaction, or user control, was paired with increasing functional sophistication via increasing use of technology. The objective of greater sophistication at the back-end was greater simplification at the front-end. So the learning environment, a combination of tools, practices and content, became richer as an organisation's on-

line learning progressed. (McKey, 1997)

Ultimately the web page metaphor used during the nineties was limiting as it didn't allow for anything other than a technology-centric view. Cooper and Reimann (2003) suggest that engineers and technologists think of systems using *implementation models*,

which relate closely to their tasks. This mindset also dominates learning technology modeling. The 'user' of the system was not considered despite the fact that they may have a distinctly different vision or *mental model* of the system, which relates to their required or desired, use of the system, not its technology makeup.

This model in Figure 2 from Cooper and Reimann (2003, p23), who in turn drew upon the earlier work of Norman (1989), describes how we can bridge the gap between the seemingly opposed implementation and mental models. What Norman originally labeled the designer's

model, Cooper has termed the represented model. Cooper and Reimann contend that the represented model must account for the implementation model yet the closer a designer (of software or systems) can come to the target population's mental model, the more successful it will be. McKey's (1999) concept of the Total Student Experience also took this view. It revealed that the student's mental model of an online learning system was very different to the implementation model.

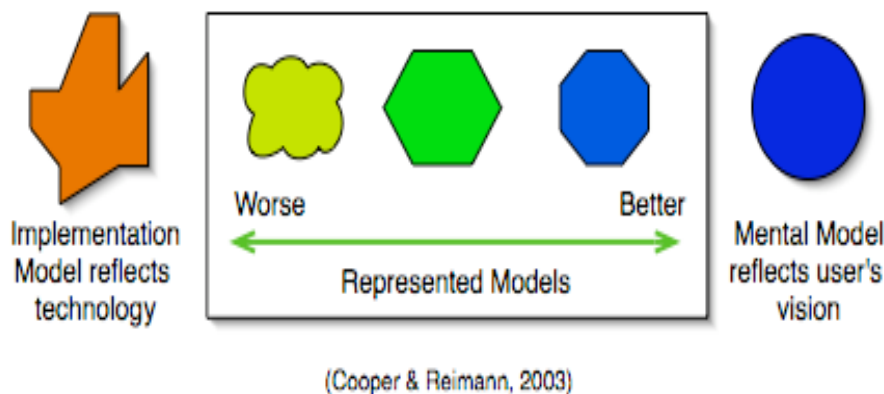


Figure 2 – System Design Models - The way software works is the implementation model. The way users perceive their goals is through their mental model. The represented model is the way designers choose to present the workings of the application to the user. The designer's goal is to match the mental model as closely as possible. (From Cooper and Reimann, 2003, p23)

It made sense that the dominant perspective underpinning a maturity model would be a represented model. Yet what can encompass the technology and systems, the implementation, instructional and learning methods, the business needs and the learner's preferences all at once? The concept of the learning environment has been used. The learning envi-

ronment encompasses all the available variables which will hinder or support learning. It is too narrow a vision however, to just observe one or more of these variables. It is only by taking a holistic view of the learning environment that we can observe evolution or progress.

Why is corporate learning different?

While training still dominates the learning expenditure of corporations as a necessary cost for compliance or competence purposes, they are increasingly concerned with performance as a driver of competitive advantage. McKey (2006) has shown that there are three dominant perspectives within any organisation; the business, purpose and technology, *in addition* to the people themselves. Hence, for any conceptual framework to gain acceptance in a corporate environment, all these perspectives need to be taken into account.

Yet these perspectives are often in conflict. The technologists and educators within an organisation typically follow an implementation model for their work. Senior management however, usually develop mental models or vision to direct their business strategy and tactics. In addition, while implementation is usually discussed in capability terms (or inputs), performance and vision

are mainly framed as outcomes. Any model aiming for easy interpretation must therefore be a represented model that attempts to incorporate

style and method helps ensure the desired learning outcome. Knowing *why* the learning is required will help ensure that the learning is applicable and of use in the organization.

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In addition to the *what* and the *how* when learning is applied, we must also ask *why* it is needed. This is perhaps the primary short-term driver for any organisation seeking success, be they profit or non-profit (this differs from the long-term mandated role of the education system). Corporate organisations require learning for distinctly different purposes depending on their development stage (from start-up to mature), the lifecycle of their products and the current competitive and regulatory environment. Hence, at any given time, an organisation may be concentrating their learning on any one need – of business operations, business improvement or business transformation - or all three (Figure 3). Cole (1998) has a similar view with his three level role and skill hierarchy between workers who require technical skills, supervisors and middle managers who need interpersonal skills and senior managers who use conceptual skills. Continually considering the appropriate learning

Learn- ing	Organisa- tion Focus	Description	Who
Task- based	Business Operations	Core technical skills focus for both process and essential behaviours. Compliance & competence.	Inductees, Team Members or Function Managers
Goal- based	Business Improve- ment	Either process, strategic or behavioural and inter- personal.	Business Managers Senior Managers
Aspira- tional	Business Transfor- mation	Personal and professional development and concep- tual skills for larger organ- isational and cultural pro- grams	Business Managers Senior Managers Senior Leaders

Figure 3 – Organisational Learning Stages
(From Redbean Learning Solutions 2006)

Building a Learning Environment Maturity Model

Figure 3 provides an important first step in establishing the appropriate perspective for a learning environment maturity model. It represents a number of progressions; from behavioural to cognitive learning, from large scale delivery to personalisation, from repetitive skill and compliance tasks to unique problem-solving or scenario-planning and possibly from instructivist to constructivist in nature. Multiple aspects of learning change with need. Each of these needs, methods and audiences require distinct learning environments and approaches for their success.

In addition, gaining competitive advantage from any learning intervention demands an intimate knowledge of how that learning will merge with people's work and passions. One of the banes of the corporate learning community has been the separation of work and learning. Poor retention, wrong timing and inappropriate knowledge are all deficits of the scheduled classroom event. Flexible, sophisticated learning environments are a means to merge work and learning for maximum efficacy of the information/learning intervention. Learning environments differ along

time and size scales as well as place. One size does not fit all.

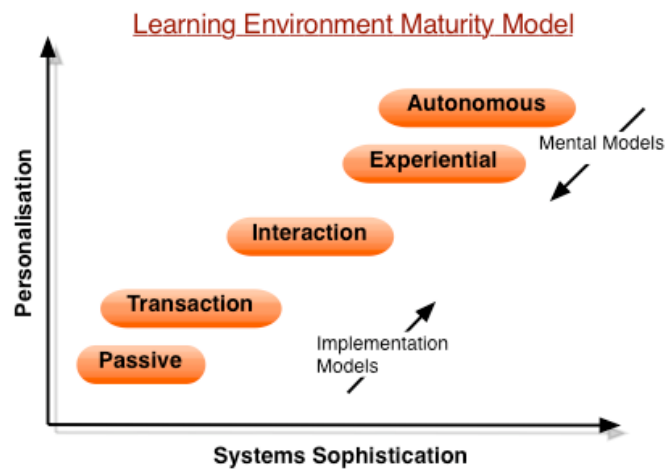


Figure 4 – Proposed Learning Environment Maturity Model (The progression from the bottom-up is systems and inputs driven while the top-down view is defined by personalisation and outcomes).

The learning environment maturity model proposed in **Figure 4** is a vector resulting from the combination of two scales, based upon increasing personalisation and systems sophistication. Increasing personalisation is a goal of many in the learning and performance support community who abide by a constructivist and contextual learning philosophy and is certainly a goal of corporate organisations. They argue increased performance can only come from increased skills, responsibility and improved support systems which allow immediate application of new learning. (Holbeche, 2005, Jonassen, 2003)

The learning environments described begin with implementation models (passive and transaction-based learning environments) while the interac-

tion stage bridges these to the mental models of experiential and autonomous learning environments. The shift from transaction to interaction stages is revolutionary and would be time consuming and costly for most organisations as it ultimately requires sweeping changes in organisa-

Knowing why the learning is required will help ensure that learning is applicable and of use to both the organization and to the person.

tional practices and culture to implement successfully. However some companies are investing heavily in interaction stage technologies such as Web 2.0 and 3.0 etc . (HREF 1)

The element of interaction between user and system and user and peers (collaboration) is a primary indicator of progress which exists at most stages. I have chosen to use Schwier and Misanchuck's (1994) "three levels of interaction based on the instructional quality of the interaction "

1. A **Reactive** interaction is a response to presented stimuli
2. **Proactive** interaction emphasises learner construction and generative activity
3. **Mutual** interactivity would be characterised by artificial intelligence or virtual reality designs (Schwier and Misanchuck, 1994)

The five stages in Learning Environment evolution

1. Passive Learning

Passive learning environments are defined as such because the environment itself contributes little to neither the teaching nor the learning taking place. The classroom is a passive environment that in recent times has become more sophisticated.

Techniques, learning content and learning programs may be very sophisticated at this level. The use of shareable whiteboards and lecture broadcasting technologies acts as a

bridge to transaction-based systems. They are typically reactive on the interactivity scale.

Passive environments are defined by simple manual courses and face to face lecture delivery. Web-based information-centric resources and email communications. There is little interaction yet a high level of involvement can still be achieved with appropriate instructional design.

2. Transaction

Transaction-based systems dominated the first era of the Internet. Systems which can transact banking, purchases, learning assessments and record static and dynamic data only aid the administration of such functions. As Porter (2001) points out they do not significantly change or enhance the function. Hence, this first era was about improving the existing paradigms in business and education. On the interaction scale they are typically proactive. The user has more choice but only within lim-

ited boundaries. While they provide a degree of personalization, most learning content is still one-size-fits-all.

This stage is dominated by course-centric Learning Content Management Systems (LCMS) and simplistic eLearning courses. The current online learning market is mostly transaction-based systems with little personalised learning. Used mainly for compliance and competence courses and for the provision of information.

3. Interaction

Interaction-based systems remain rare and are revolutionary in terms of business and learning. These are best defined technology-wise by the Semantic Web or Web 2.0. Both enable technologies which allow greater user control and interaction. Interactivity at this phase requires a much higher level of sophistication to provide mutual-adaptivity and the use of collaboration as a learning tool would be widespread. Mutual-adaptation begins to simulate human interaction.

Interactive and collaborative systems, tools and learning methods that require foundation systems integration to deliver interaction. Personalised learning is simulated here by good interface and system design. Personalised performance support is provided through profiling and tracking. The shift from transaction to interaction systems is revolutionary.

4. Experiential

The experiential learning stage is where the system cedes control to the user. User-defined simulation is a major learning method, either self-paced or collaborative. Learning moves from personalised to personal. This stage takes interaction to the next degree and applies it. High-end role play, simulated practice and decision tree analysis dominate this stage. Non-destructive problem solving and modeling allow for experimentation. While currently expensive it still yields a good return on investment.

5. Autonomous

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 certain 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. In addition, these should be highly personal systems allowing full control, customisation and privacy.

Performance driven, on-demand learning systems provide autonomous learners with what they need when they need it. Independent, just-in-time learning methods and flexible modular content support a performance culture.

How can we use a Maturity Model?

A maturity model can help clarify and guide strategy, investment and activity of corporate learning and performance support. In lieu of an easily understood model, it is often left to the technologists to dominate and debate and the direction of learning systems. Corporations are increasingly dissatisfied with their return on investment and quality of online learning systems. They need a way to inject their mental model into the design discussion.

This is a learning model. Our perspective changes (or matures) as we progress through the stages of the model indicating that we are both learning and applying learning. This is also an organisational change model. Organisations who are still providing passive or simple transaction systems may be behind their industry sector benchmarks and competitors. Providing more sophisticated learning environments will increase the skills of current staff while attracting younger, already skilled recruitments.

It is also imperative to consider the learner. Not everyone has the skills or desire to be an autonomous learner all the time. The diversity of learners will see them start at a level dependent on previous experience and skills. A learner may have only experienced passive and transaction models of learning (school, lecture, essay and exam) and not have the skills or confidence to progress into

interaction or collaborative learning models nor take on the responsibility for their own learning to become autonomous. In fact education systems 'train' us to be typically either passive or transaction-based learners. Only when we get to higher education are the more interactive learning types and environments encouraged. Or as Pfeffer and Sutton (2006) put it " an education system that emphasizes problems that have right or wrong answers... does not do much to prepare people to confront and live with ambiguity". Ambiguity and 'no-right-answer' are hallmarks of the shift from knowledge centric to people centric learning styles and models that the interaction, experiential and autonomous learning environments provide. The systems must support the learner to manage this.

Sophisticated learning environments will not necessarily provide competitive advantage for all sectors. Areas such as health and finance are embracing new learning environments while some non-customer-facing sectors may neither desire nor require this increased capability. One company may simultaneously develop learning environments at several stages for differing purposes. Quite often mobile or remote sales staff use different systems to back-office staff. While it is wise to progress the whole organisation through the model in-step for many reasons, that should not stop individual units from leaping ahead. They may however be stranded if a lack of organisation-wide systems integration reduces mobility or access.

Summary

The learning environment maturity model proposed here has built on other established models. From the primitive perspective of interaction phases (McKey, 1997) it has been used in various forms over the past ten years and has proven effective in communicating the needs and objectives of both implementation and mental models of learning environments.

Corporations need a way to inject their mental model into the design discussion.

Further research into this model is currently being undertaken to validate some of the assumptions presented. An industry study will evaluate whether the model is suitable for benchmarking firms in similar sectors. Additional research could also consider the capability, synergy and performance of each stage. This would further clarify and refine the differences between stages.

Of particular benefit is to use the model to illustrate the tools, development methods and learning environment needs for each level. Software vendors and developers could provide differing product suites dependent on a client's needs as they progress through the model.

Once validated, this model may then form the basis to evaluate the effect of learning and performance support

programs and systems as one indicator of competitive advantage for organisations within various industry sectors.

The ability to match and align learning environments to organisational needs and investment is an important goal and it is only through further understanding of the critical elements for successful environments that can we achieve this. This could then hasten a future where we move away from the one-size-fits-all toward a personal learning system.

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