Integrating Distributed Learning with just-in-context Knowledge Management

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Abstract: This paper addresses some key design issues in e-learning, and its integration with knowledge management. The underlying premise is that the purpose of e-learning is useful knowledge, and that the design of e-learning should therefore be integrated with the design of related knowledge management – particularly personal knowledge management. e-learning will be explored using the notion of "distributed learning". Knowledge management will be explored using the notion of "just-in-context knowledge", emphasising both the contextual underpinning of knowledge, and its strategic value – that is to say its applied value, and its embeddedness in decision making processes. The potential for distributed learning to optimise shared resources is also explored.

Keywords: Distributed learning, e-learning, knowledge management, just-in-context knowledge management, digital learning, blended learning.

1. Introduction

This paper is based on work in designing and building learning materials and environments in a variety of contexts:

- Knowledge bases for community and vocational training in developing countries in the Middle East and South Asia;
- Learning materials for schools in Southern Africa;
- e-learning for open and distance learning courses in the UK;
- Research on strategy and evaluation tools for e-learning, expert systems and knowledge management.

It shares with many others the frustration at systems that "do" e-learning, but for the most part do it only marginally differently from what we did 10 or 20 years ago using other quite adequate media, and in the process generating huge amounts of expensive digital traffic, data mountains/lakes/landfill sites, and Public Relations, but not much digital intelligence. I will try to tease out some lessons and issues on how we might do things differently if we started from different design parameters.

2. Distributed Learning

There is no doubt that digital or e-learning, or e-enabled learning has made a difference to our lives, and that it is largely based on digital information and communication technologies. However, as with all other innovations, ICT will go through cycles of development, hype, overshoot, disillusionment, shake out, and consolidated growth. We are probably currently at the disillusionment and shake out point, and will start to see more tentative, consolidated growth from now on.

But the crux of managing this turning point [for ICT like any other technology] is to realise that the key issues are not technical or technological. Once the "wow" factor has soured and faded, we need to focus on how we want to use it, sensibly, and why. There are some crosscutting trends that might point us in the right direction.

In overall terms, what has developed more than anything else is *distributed learning*. The fact that it is powerfully, cheaply, and easily (?) distributed through integrated digital media is important. But the levels of digital integration have only just started, and it is the *result* – distributed learning – rather than the *mechanism* – digitalisation, that we should focus on.

There is and will always be proprietary information and knowledge. But most of the old exclusion techniques and cycles are changing or fading: you can no longer be excluded by age – younger and younger people are getting hold of all the information they need and want, and quicker. Likewise distance, nationality, religion, wealth/parentage, "outlaw" status, libraries, academies, country, cost, sequence and ritual, and even access to technology are all being penetrated.

Learners are better sited and sighted – they are quite simply in a better position to see what is going on around them, interact with it and with people who are involved with it, and learn from that. They are also better "cited" as they can learn from and refer to a much wider range of people and texts, more quickly and effectively. Some of the ideas that I will use in writing this paper, for instance, I got from a casual reading of various Blogs/Klogs a few hours ago.

So what matters is that learning is distributed – the medium does not matter. The digital media are well established. We have arrived at quite a different media and communications platform – so we no longer need to be fascinated by the latest medium or gadget, and should get on with the job of using whatever we have – blended media and blended learning: blended-*distributed*-learning.

Following from this trend, i.e. comprehensively distributed learning, is the second trend, namely that not only is the *blend* important, but none of us are at the *point of control* – there is no single *point of control* – there are many, competing points at which learning and learning resources gets initiated, stimulated, certified, commodified, patented, copyrighted, shared illegally or legally, accredited, and all of them are changing.

Learning and learning resources are [and will increasingly be] distributed to an unprecedented extent. All bets on the old walls and fences around learning are off. This is, surely, positive. If so, we need to go with the flow, however much our institutional, personal, and patronage practices get disrupted. As I said above, there will always be proprietary and public learning resources and opportunities – and there will therefore always be business and work in enhancing learning. And conversely, there will always be interesting developments in sharing knowledge – developing the "new commons" of the knowledge society.

3. Just-in-Context Knowledge

Snowden (2002:3) citing Stacey (2001) talks of the paradoxical nature of knowledge, which is both a *thing* and a *flow* or a *process,* and he emphasises that we have to see it as *both* – not the one or the other. He also cites some key heuristics: "knowledge can only be volunteered" and "we only know what we know when we want to know it', and he emphasises the value of narrative.

Knowledge is thus embedded in relationships and context, and little of it is amenable to commodification and categorisation in a database, no matter how sophisticated. Most of it is situated in the spaces of the relationships between human beings. And narratives come back to take up their place alongside algorithms, just as they did in Athenian discourse.

This is similar to the notion that knowledge is essentially *strategic*, and information is essentially *procedural* (Williams 2001). Knowledge subsumes and includes content as well as complex procedural algorithms, but it is more akin to *intelligence* than information[1]. It operates within a context, and is implemented or used by particular people in particular positions and contexts. To paraphrase, knowledge is a synthesis of the *how* and the *why* things get done, whereas information stops at the *how.* Knowledge is paradoxically more contextualised, and therefore less abstract than information, even though it operates at a meta-information level.

Knowledge is embedded – it is what I would call "just-in-context". This means that it is specific to time, place, sequence and timing, and position and relationships – within discourse communities/communities of practice, and personal relationships of trust and confidence. *Your ability to exercise what you know is partly dependent on the fact that I know what you know, that you know that I know that, and that I trust you to use it appropriately.*

It follows that knowledge cannot be abstracted from context – physical or social. Snowden (op cit: p3) says that to manage knowledge "we need to focus more on context and narrative, than on content". In relation to e-learning, or distributed learning, what is important is that we don't restrict learning to abstracted procedural information, and call that knowledge. Learners need to develop their own knowledge, through a process of learning that will include procedural information, but which they must relate to various contexts – contexts in which it is generated, learnt, used, and in which they can use it. Algorithms can only be understood and used within narratives.

[1] The point becomes clear if we substitute "intelligence" for "knowledge" and ask ourselves what on earth "intelligence management" would be.

4. e-learning

Where have we got to in e-learning? There is undoubtedly much good and innovative practice. But there are also many cases in which only the technical transition has been made, and not much more. Lots of "e-learning" would more appropriately be called "e-copying/photostatting", "bookware", e-distribution, e-searching, and perhaps e-publishing. But this is not much more than increased efficiency on the supply side. It does not necessarily impact on effectiveness in satisfying learner demands, and in line with the trends in *down-loading* and externalising costs from the public sector to the public, it might even decrease effectiveness in some cases. Some members of the public can't afford the externalised costs, and are unimpressed that the internal "costs" have been reduced to help reduce taxes and fiscal deficits.

It is commonplace now that we are suffering from information overload, as well as email-induced communication and interaction overload. From a systems design point of view, we need to determine the *learning* parameters of digitising distributed learning. If the aim of learning is to explore your surroundings to accumulate useful knowledge, what is it that contributes to learning and knowledge – over and above faster copying, searching and distribution? This might be called e-linking, e-relationships and networks, and e-enhanced strategy.

5. Designing Distributed Learning

The basic design parameters are:

> Linking, analysing and synthesising at a conceptual level helps to facilitate learning, and to capture and manage the knowledge that results from learning. Relationships require interaction, including both intellectual and personal relationships. And strategy requires a synthesis of information about procedures and context, and the experience and knowledge against which to measure and evaluate them.

If we know that knowledge includes content, context, and relationships; that learning requires exploration, and links at the conceptual level, as well as personal and intellectual interaction, and the ability to manage information about procedures and contexts against the template of experience, then we have the beginnings of a framework for the design of distributed learning.

Exploring includes finding out what is out there just as much as putting out your "feelers" – physically and intellectually, to see what happens. So in a digitised world of distributed learning, we should use all the digital and analogue media, particularly as they become cheaper and more user friendly – email, websites, weblogs, digital video and webcams, digital photography, and so on.

Links at the conceptual level need to be more than just linear-embedded "threads", elegantly "woven" by e-moderators. However interactive these are, and they do enable valuable virtual communities or virtual "classes" to flourish, they are no more than *stacked lists,* or what I call "stringed-bead discourse" – a number of "beads", each one of which is only linked to the one before and after it, with little or no relation to any of the other "beads", apart from some social and stylistic "aesthetics". The same applies to the electronic "filing systems" that are available in word-processing packages (albeit with some primitive hyperlinks available).

What is needed is more than a linear architecture – and there are two-dimensional graphic options in some of the e-mind-map packages available, but these are hardly mainstream in VLEs.

What is needed is a two-dimensional plane on which learners and teachers can explore, elaborate, rearrange and restructure, link and question, the relations between concepts and contexts, with dynamic granularity and navigation [which just means that you need to be able to navigate "free-hand" and zoom in on any point of the plane just as you would when using a digital photography cropping facility]. A facility to establish icons alongside and/or related to objects on this plane is also needed. Behind this (in XML format) there needs to be a data base, linked to the metadata on this plane. And this needs to be available in a collaborative workspace format.

This could be developed further, based on some of the available software. It would start to deliver some of the dynamic metadata links that are the basis for any non-digital, non-technical learning and knowledge, in those rather sophisticated "neural network processors" called humans.

5.1 Just-in-Time Informal-Formal Knowledge

Snowden (op cit) outlines a framework for facilitating just-in-time knowledge. His paper is very useful, as he details a framework for analysing four domains of knowledge, each with different management implications, and then relates just-in-time transfer to those domains. I wont repeat the details – they are quite extensive, and there is no need to try to summarise them here.

5.2 Decision Making

Given that the aim of learning is useful knowledge, two things are necessary for learners to manage their own knowledge as they learn. They need to be able to capture and manipulate the links that constitute learning and knowledge on an appropriate high granularity graphics package. Second, they need to be able to capture the knowledge, and access it efficiently, for use. Which means they need to be able to search through the information available quickly and effectively.

That in turn means that the knowledge that is commonly held should reflect the decision-making processes that someone *using* that information and knowledge would follow. Given that the conceptual map is metadata, it would not inherently be a problem for there to be a variety of different maps, each for a different type of user. The users in turn could customise their maps, and the links from them to the database, in line with the specifics of their context, as they change from time to time. So the software would be required to include the necessary dynamic editing facilities.

6. Sharing Knowledge

I said, above, that there will always be proprietary and public learning resources and opportunities – and there will therefore always be business and work in enhancing learning. And conversely, there will always be interesting developments in sharing knowledge – developing the "new commons" of the knowledge society.

One of the paradoxes in distributed learning is that we expect people working in this sector (certainly the public sector part of it) to share learning resources within a competitive and increasingly commercialised market, in which their own jobs and livelihoods are neither protected nor guaranteed.

If it is true that distributed learning no longer has a single point of control, and that distributed learning increasingly occurs between a myriad of different points – some human and some digital – then it would make sense to optimise the potential for sharing information and knowledge, if possible.

Most commentators (see David Gurteen's website for examples) seem to agree these days that only "a limited amount of knowledge can be fully separated from its owners and transferred to the best practices domain" (Snowden op cit p13). And the increasingly "marketised" and commodified environment would not seem to make sharing possible.

Both teachers and learners face a paradox: how can they be expected to share information and resources in a competitive, commercial market? Action research in designing and implementing a knowledge base for vocational training for the community sector in the Middle East has started to put a working model together. This knowledge base design could be used to solve this paradox, and as the basis for national and international networking and sharing in schools and in the vocational training and community sectors.

Schools and community sector programmes are expected to "share resources for the common good". But they are also expected to maintain their own (competitive, dare one say it?) value added, and they have to keep an eye on their own careers, in a job market where there are few certainties and even fewer guarantees. Researchers based in Reading (Williams and Carmichael) worked with a training centre in the Middle East to identify their training and learning problems, and then to design and implement the software for a knowledge base appropriate to their needs.

6.1 The training centre wanted to:

- Use the vast amount of learning material available internationally, but adapt it to local context and requirements.
- Share resources as far as possible, but maintain a competitive advantage.
- Add to available resources, and expand its business, while sharing (both ways) with outsourced trainers and external institutions.
- Build up a resource which could be used for specific, narrowly defined training requirements, but could also be used flexibly for different needs, clients, and contexts without starting from scratch each time. The output

also needed to be available in Arabic and English texts and scripts, and displayed in various formats.
- Enable trainers and training managers to explore and learn from related research, evaluation, theory, and other institutions.

6.2 Stages in the process:

- The core users were narrowly defined: as trainers and training managers (and less so, administrators). The elements of the system had to be checked to see if they would fit into the organisation's workflow on a daily basis.
- The key training and learning elements had to be defined, and if possible separated into different layers of resources, that could be combined, revised, and added to, in separate operations. These were "learning objects" such as pictures, texts, graphics, exercises etc, "lesson plans" which combine learning objects, and "courses" which combine lesson plans. Lesson plans have related "learning outcomes" and assessment frameworks linked to them.
- The outputs needed to be defined, and the software mechanisms created to link the resources into lessons and courses, and provide the outputs.
- Further links need to be put in place to related research, theory, evaluation, and institutions and people.

6.3 Findings

- Consistent institutional backing and commitment is critical to success or failure.
- Open source software development can provide the flexibility to combine languages, scripts, and learning objects and lesson plans, effectively, without the expense and rigidity of proprietary packages.
- Most of the "learning objects" can be shared in the pubic domain.
- Most of the "lesson plans" that use these learning objects can be kept in the private/competitive domain where necessary. This distinction between mostly public domain learning objects, and mostly private domain lesson plans and courses enables substantial sharing, and flexible "tagging" of resources to indicate how and where they may or may not be shared.
- Substantially increased flexibility can be achieved in combining elements in the resource base and "tagging" them if XML (rather than HTML) is used – and this does not affect the ability to access the resources via any Internet browser.

7. Conclusion

I have sketched some of the basic elements of a framework for an integrated approach to the design of distributed learning and just-in-context knowledge management. The learning and knowledge issues have, hopefully, been separated out from the technical issues and the technology, and then reinserted into a debate about how the *learning* design parameters could be realised and developed with current capability, and how the potential for distributed learning to benefit from shared resources could be managed within an increasingly commodified world.

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