Virtual Learning, Web Based Training and Knowledge Management

Tim BENNETT, United Kingdom

Key words: Knowledge Management, Virtual Learning, Web Based Training, Learning Journey.

ABSTRACT

This work is posited as a work in progress. It describes various speculations concerning the effective strategies that need to be considered when applying learning to a virtual environment whether web based or within a technological forum such as the American based 'Blackboard' programme. The aim of the paper is to develop, for discussion the conceptual framework within which these activities should take place, namely the 'learning journey'. Further it is proposed to place this within a knowledge management context. Examples will be drawn from a variety of sources including the writer's own studies of methods already used within academia, and the UK Government web based learning initiative 'LearnDirect'.

There has been a tendency for learning and training strategies to be seen as an extension of past practice rather than the need to rethink and start afresh. Further, technology has also been seen as an innovation for learning and training becoming at times the driver of the strategy rather than the vehicle. A distinct difference needs to be identified at the outset between information and knowledge. Information and data should be understood within the context of the learning and training hierarchy being at its roots with knowledge and wisdom as its fruits. A framework that fits will be proposed within this parameter or analogy and enables one to evolve from the other. To enable this to occur key criteria has to be considered to enable the learning and training strategy to develop. The key components are proposed within a model STEMS (**S**trategies, **T**echnologies, **E**nvironment, **M**ethods and **S**tructures). This will be presented for discussion. The model further attempts to incorporate the organisational dependencies and strategies. Any learning and teaching strategy has to be an integral element of central aspirations rather than a standalone vision. Virtual learning strategies are in essence similar to knowledge management key enabling principles for information dissemination and knowledge creation.

Within the context of knowledge management the proposed model provides the mechanism for developing a strategic framework for development, not a learning experience. This in turn provides key indicators of how the strategy for web/virtual learning should be developed, ensuring the horse is in front of the cart, at all times. Therefore each specific subject application within the web learning and training strategy has its own unique journey. This journey then becomes the glue that binds the components of the model proposed.

The paper reflects early work in this area, and seeks to develop associations between the various factors mentioned. It does not purport to offer a definite solution, but to examine the

TS2.1 Virtual Academy – Case Studies and Experiences   1/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

context of effective learning and training strategies presented in a paradigm for further empirical study.

CONTACT

Mr. Tim Bennett, Bsc MRICS AIMC
Kingston University
Knights Park
Kingston upon Thames
Surrey
KT1 2QJ
UNITED KINGDOM
Tel. + 44 208 547 2000
Fax + 44 208 547 7087
E-mail: t.bennett@kingston.ac.uk
Web site: www.kingston.ac.uk/surveying/

TS2.1 Virtual Academy – Case Studies and Experiences   2/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

Virtual Learning, Web Based Training and Knowledge Management

Tim BENNETT, United Kingdom

1. INTRODUCTION

Knowledge has for many years been an asset untapped or its potential realised. This has never been truer of the organisations, which have a UK governmental parentage. Some have now left the parental home but still see the lessons learnt in their infancy as instrumental to their strategic development. Others are still in the institutional family but with aspirations of their own. Two key sectors that reflect these differing family bonds are the Higher Education and the Healthcare sector. Both have benefited from the involvement of government and both have also been burdened by political climate changes. Education and medical practice have in their own terms been in existence for centuries. Within medicine the Hippocratic oath itself sets the stage for the sharing of knowledge with the requirement to pass on knowledge to others. The knowledge gained over this period of time is therefore potentially vast and many may say has been successful in its dispersal. It could be argued that the reality is however different and it is more likely to be able to be measured in terms of knowledge lost than that effectively gained. Recent consideration of educational practices in the UK appears to be developing in cycles with many supposed new innovations having similar themes and trends to those in practice a decade before. Part of this learning cycle within an organisation is the interface with those in the organisation either in terms of delivery or collection of knowledge and the ability to contextualise this information so that it becomes organisational wisdom. This then in turn can be disseminated through specific knowledge management architecture unique to the host organisation. The paper use case studies to test this theory at a simple level by examining the user learning interface, i.e. 'learning delivery' within the organisation and the learning experience. The UK Government's learning initiative 'LearnDirect' will be discussed first using the UK's public health service as a case study

From this understanding a model will be posited to provide a strategic framework for developing knowledge management principles within government rooted/funded organisations. When considering knowledge itself, this is important to understand in terms of its nature and structure. *Armstrong (2000)* identifies a thermometer model of knowledge, considering non-inferential knowledge, highlighting the key principles as fact, perception and judgements with his model providing an empirical theory to the psychological approach to knowledge and contemporary epistemology. However, the view that scepticism (*Stroud - 2000*) in our approach to knowledge acquisition and our understanding of functionality by users is also important when understanding the functionality of the model by the user and their approach to its use.

The model proposed by this paper aims to provide a contextual approach for development of learning and teaching within a Knowledge Management environment. This type of approach mirrors *Williams (2001)* who identifies this as a Default & Challenge model of knowledge. This aspect will be considered later in the paper together with the individuals' ability to

TS2.1 Virtual Academy – Case Studies and Experiences   3/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

acquire knowledge. The discussion will centre on the users 'learning journey' in the context of a specific learning and teaching experience.

2. CASE STUDY 1 – UK NATIONAL HEALTH SERVICE (NHS)

Having recently celebrated its silver jubilee the UK's National Health Service (NHS) can be clearly identified as an organisation, which in its short life has had many rebirths, various adopted governmental parents and a large amount of sibling rivalry within its domestic walls. It is unique in terms of its commercial counterparts, as governmental policy has played a large part in its creation, evolution and at times its downfall in terms of perceived and actual performance.

Currently procedural policy has moved away from 'internal markets' put in place under the Thatcher government of the early eighties. This produced a competitive environment of moat building and financial rivalry around local health provision. The only real benefit from this approach was that it created an understanding of health care value. This in turn enabled healthcare managers to understand the value of their assets. Current healthcare policy has now taken a different view with a three stage patient pathway with Primary, Secondary and Tertiary care with the initial stage of care being focused within the locality. Cases are then applied to the secondary care stage namely the acute hospitals. Rare health issues are then applied to regional or national areas or centres of excellent, which may only exist in a few locations within the country.

However this history of governmental change has developed a culture climate within the NHS, which does not providing fertile soil for KM strategy. It is perceived that strategy from the political boardroom should be viewed with scepticism and mistrust. Apply now the principles of KM strategy being led from the top and one can see that little will be achieved. Therefore governmental policy has been to devise specific outcomes without consideration of the structure and processes that need to feed its development and growth. One such outcome is training. Recent government training initiatives have endeavoured to link education training via web-based training and virtual learning environments. This case study examines the UK government's virtual training programme from the perspective of healthcare sector.

From this initiative 14 pilot sites have been set up around the UK not specifically related to the healthcare sector. The NHS have taken local initiatives to use these tools as learning mechanisms for their staff. This has resulted in the development of KM centres based in clinics and medical practices. The whole principle of KM strategy has in fact been turned on its head. With local interest being the driver rather than boardroom strategy. Further the KM seeds have been sown as a consequence of a web based learning tool, which in normal circumstances would have been a likely outcome of a KM strategy. A further issue of this approach is that the tool is a one-way street being a delivery mechanism not a sharing facility.

The system architecture of 'LearnDirect' is to provide information rather than to create a specific user experience. The principle appears to be that 'one hat fits all'. The format of the learning material is limited with the main information being provided in written format or

TS2.1 Virtual Academy – Case Studies and Experiences   4/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

audio files. If the architecture of the learning experience is in fact set against user expectations or the premise of an effective learning experience it falls short.

The resultant forum for this on-line training initiative has been 'LearnDirect' (www.learndirect.co.uk). Having raised the need for training needs through the normal appraisal system within the healthcare provider organisation, users can choose courses that meeting their self development goals. The method of delivery is via the web with access accounts being created for users once they have registered. Normal delivery is through training notes on web pages or through audio files with supporting material.. A survey was undertaken of a small number of users within a local healthcare economy with a £0.5 billion turnover serving approximately one million patients. The users represented junior and middle management further segregated into varying levels of computer literacy ability. A specific training skill programme was chosen which could be identified as useful to all, namely time management skills. This was also chosen without prior knowledge of its contents and was assessed in terms of its appropriateness on the specific learning outcomes defined by the programme. The users undertook the training at their own pace and then were asked to partake in a questionnaire. This was devised to assess the format, content and appropriateness of the training material against the background of the participant's profile. Those who were more computer literate found the format easy to use. Those with less of these skills found the principles of web more difficult than those of reading the material once the system had been accessed and the contents printed. In terms of the content senior staff found the material poor, inadequate, lacking in depth and suitability to their perceived level of prior knowledge. Some found the material patronizing. Those more junior staff found the material basic although some material did provide some good ideas for changing office practices.

The structure of the material was then analysed in light of the user survey. The resultant picture was basic due to the simple format approached by the government online delivery, i.e. that it should be available for all. This in itself determines that the strategy for its delivery was that there was only one 'learning journey' The learning module chosen had four levels with users reading each page before moving on. Each page was simple in its content with short paragraphs and bullet points – similar in nature to a PowerPoint presentation, with each slide representing a perceived knowledge level. The user had little control over the experience with a forward and back command dictating movement.

The quality of the analysis is not conclusive in terms of the quality of the 'LearnDirect' programme as a whole, but was used more to develop principles for the contextual model. This in turn could then be subject to more research. The case study helped formulate conclusions relating to the user experience rather than to the material used within the study programme.
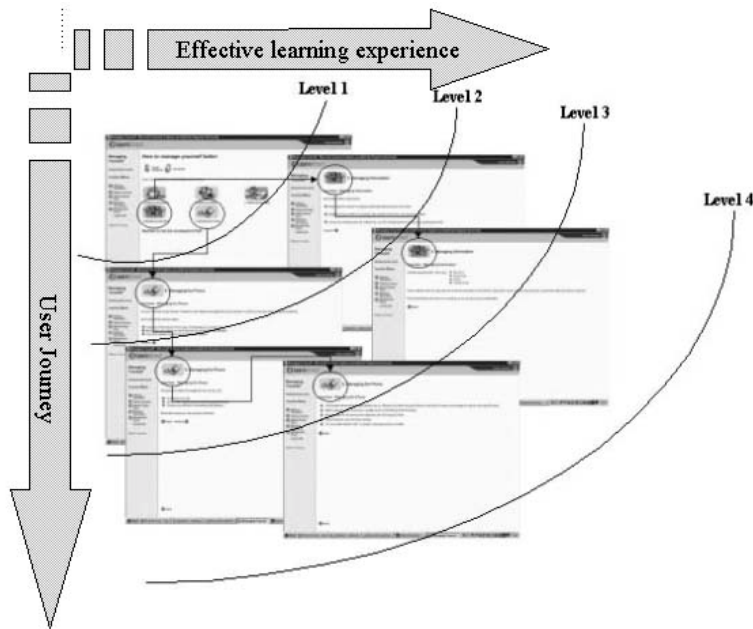
TS2.1 Virtual Academy – Case Studies and Experiences   5/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

Fig 1. UK Government (Ufi) 'Learning Direct' – User journey & learning experience differential

3. CASE STUDY 2 – UK HIGHER EDUCATION

The Higher education institution used in the case study has been in existence for over 100 years. Recent organisational strategy has invested in the development of on line learning facility using an American propriety software package called 'Blackboard'. Initial development is aimed at supporting current teaching and learning practices of chalkboard delivery but the case study undertaken used the system to a standalone e- learning experience for a specific area – namely environmental impact analysis. Two sets of thirty undergraduate students were sampled over a two-year academic period.

The students undertook the same taught module at the same academic level in consecutive years. No account at this stage of the study was taken of prior knowledge, qualifications, or levels of computer literacy. The study endeavoured to match the key learning outcomes in the subject area with a single assessment. One group was provided via the Blackboard programme with a mixture of information formats which provided a distinct context in the form of a project to help achieve the learning objectives. These included text based material, CAD movie, images and web databases all within the e-learning environment. The user experience was planned as a journey, mapping the options and material that would be available to the user (see figure 2). Choice was built in similar to that of traveller on a train journey, knowing their specific starting point and destination but allowing freedom to choose their route, from stopping at every station to opting for an express journey to the end.

This experience was set out in a similar manner to a map for a web site or a storyboard for a film. This then provided a framework for the learning experience to be built upon. Figure 2 identifies the journey defined for group 1's case study experience. Each part of the journey
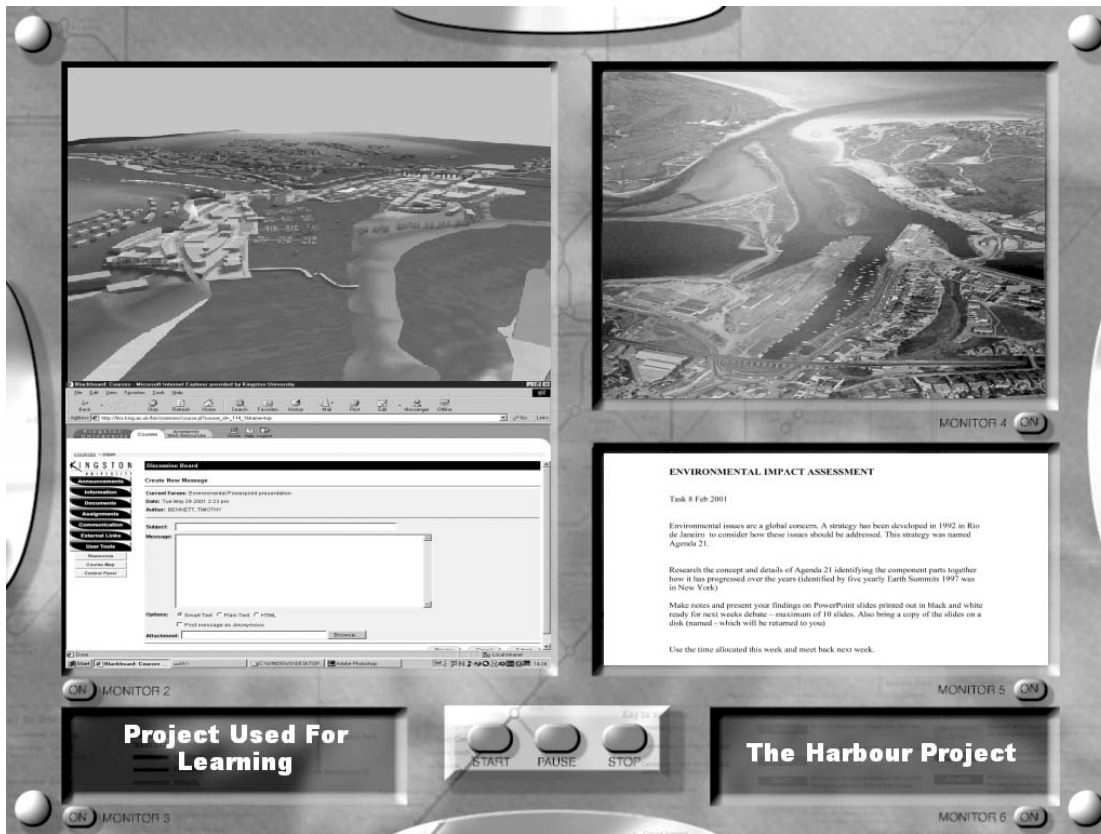
TS2.1 Virtual Academy – Case Studies and Experiences   6/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

Figure 2 – *The Learning Journey – (Source: Bennett 2001)*

provides distinct media platforms and choices, which in turn are linked to the key learning objectives set out for the exercise. Assessment can form part of each sector or be an individual element on its own part way through the journey or at the end. More importantly the journey not only needs to incorporate a delivery mechanism but also a sharing ability. The software used provided a platform for sharing. The on-line task specifically identified that the sharing of knowledge was encouraged. No such reference was made within the paper based assessment material.

The Blackboard programme provided an important function in the journey planning. It is however important at this stage to ensure that the software is not driving the e-learning experience. Similarly KM strategy is not driven by the technology. The planning of e- learning needs to follow the same overriding principles.

Figure 3 provides an indication of the different media formats that were used, it should be noted that the presentation is purely for delivery within this paper to highlight the context and themed formats. Sharing of the users experience and their findings occurs through a 'discussion board', which can be real time where students discuss issues as well inserting text, images or their own pictorial interpretations live for other users responses. This process can also occur off line for later retrieval. This facility provides the context for knowledge generation from static data or lives experiences. Consider this within a KM generated culture and innovation and new ideas can be born.

TS2.1 Virtual Academy – Case Studies and Experiences
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

7/13

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

Figure 3 – Sample Blackboard Material – (Source Bennett 2001)

The other group that were tested (group 2) where not provided with the same access to the on line material together with its project context. Instead they receive paper-based notes, which identified principles applied to the generic subject matter and further provided paper based references for students to source. At the end of a set period of time both groups were given the same assessment, which requested a discussion, rather than a project based analysis so that one group would not be disadvantage. The groups were also asked to complete an evaluation of the learning experience.

The results provided a clear insight into the distinct learning styles not only of users but also subject matters. Overall students who were provided with the on line material and a project context obtained higher marks, on average 17% higher in terms of the standard deviation within each group sample. This was reflected not just in terms of the content but also the writing style, which on the whole was better for this group (group 1) as their discussion provided a context and therefore it appeared they were more able to argue from this standpoint providing examples to support their argument or position. In contrast the other group (group 2) reiterated many of the points put forward by the paper based sources, showing that they had not been able to move from the page to their own opinion.

The evaluation of the experience made by the students was also interesting with the majority of those who were provided with the paper based sources stating that it was difficult to place the material in a context and it was too theoretical. Further many admitted that they had not

TS2.1 Virtual Academy – Case Studies and Experiences
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

8/13

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

sourced many of the other resources due to time or motivation. This could be linked back to the previous lack of understanding of the theory. The on-line group however identified that the practical application of the theory allowed them to apply the principles to other sources and contexts, which in turn helped them to discern and create arguments. Use of the resources linked to the on-line material was in all but one case extensively used and found to be easy to use. Students were asked whether other users in their group had shared information enabling others to benefit from their experience. The response was that in all cases the discussion board had provided a wealth of information, which had helped source new avenues for all. Students did not appear to feel that they had been disadvantaged by sharing their knowledge and had been surprised how they had gained from the experience.

4. CASE STUDY – SUMMARY

It was clear from the case studies undertaken in both organisations that strategic planning of the learning experience is the key enabler to providing a forum for delivery and retrieval. This in turn within distinct contexts of that data and information provides the foundation of knowledge generation. This in turn can be applied outside the education and healthcare sectors and be set as a template for e-learning in wider environments. Naturally additional factors will affect its development as the sectors studied have less of a competitive environment in terms of similar organisations whose business survival is dependant on sharing little outside the company walls.

From the findings of the case study and research into the wider implications of the strategies adopted by the organisations a model has been poisted to facilitate the development of the user learning journey within the e-learning environment of an organisation's KM strategy.

5. MODEL PRINCIPLES

The justification of the contextual approach (Default and Challenge model previously mentioned) is subject to intelligibility or semantic constraints. Wittgensten (2000) remarks that if you tried to doubt everything, you would not get far as doubting anything. This principle is important in terms of the users frame of mind when starting the 'learning journey'. There has to be an agreed reference point to start the experience. It is true to say that different user groups will have different starting frames. *Williams (2000)* continues to identify methodological constraints, which allow the direction of inquiry. Additional factors that he raises are dialectical, economic and situational. Dialectical will have an effect on the direction of enquiry, while economic considers the loss of possible knowledge purely because some possibilities may be perceived to be remote, this is a similar affect of undertaking brainstorming on your own. Costs and benefits figure here too, i.e. economic. The principle being it is important to reach some decision so that knowledge opportunities are not lost. In determining a model and as a result a 'learning experience' these factors need to be incorporated. Further, to provide a contextual environment for the model, the healthcare organisation studied previously has been used as a basis for discussion (see Figure 3). The key components or to use KM speak 'enablers' are identified within the anagram STEMS, individually meaning Strategies, Technologies, Environments, Methods and Structures. The model defines these enablers as dictating the strategy within a distinct three tiered learning

TS2.1 Virtual Academy – Case Studies and Experiences   9/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

environment - 'the knowledge onion' with separate layers making up the whole (Levels 1 to 3 identified within this model). Within each of these levels there is the ability to interface with the other levels within a controlled environment. Key players are defined in terms of their position within specific layers, based upon their needs and their ability to contribute to the central knowledge base. Knowledge needs to be defined as a product, with a clear understanding of its definition within the host organisation. This allows knowledge to be defined in terms of the language to be used whether the information source becomes the base currency or processes are in place for its conversion. In the context of the healthcare sector the model will now be discussed in brief:

5.1 Strategies

KM strategy cannot be detached from business strategy as the organisation's aspirations provide the focal point for the KM infrastructure and deliverables. Any discussion of strategies needs to build in those changes, which will be imposed from outside an organisation, ie. Technology advances and those, which the organisation itself sees as a natural extension of the business development

5.2 Technologies

This area will vary depending upon the nature of the industry, within the healthcare sector the UK Government has identified this will be a key component for driving healthcare provision forward radically changing the way patients are seen and cared for. As identified within the case study there is a move away from hospital care to local primary care, centring around technology and user interface to enable knowledge creation, sharing and medical analysis and care to take place. This therefore is a critical component in the development of KM strategy and subsequently learning and training.

The levels defined in the model do neatly fall within the parameters of current technical windows such as Intranet, Extranet and Internet environments but the model is not specifically generated around these forums more the need to development a relationship map in terms of user size and sustainability. A brief insight to the restriction of level was highlighted in the 'LearnDirect' case study.

5.3 Environment

This parameter defines the context of the organisation. This heading needs to be the facilitator to defining the key drivers for the specific environment in which the organisation sits. Key networks need to be defined. Within healthcare this is extensive, touching on government bodies, commercial organisations, research and development companies, and education to name a few. These linked organisations will have their own environments which may at time conflict with the wider aspirations of the host, for example pharmaceutical companies use the NHS as a research and development ground but see this feedback as purely their own for commercial gain. Therefore within each level their may be distinct routes which cannot be traveled by other users in the same level. Similarly there may be relationships between levels with organisations that do not feedback into the host. An

TS2.1 Virtual Academy – Case Studies and Experiences   10/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

example of this again may relate to research and development contract between higher education, hospitals and pharmaceutical companies, which have distinct feedback journeys which do not necessarily share all data with each other.

5.4 Methods

When applying the parameters from the model it is important to identify the specific nature of the users of the virtual learning/web based training. This will allow the specific learning to be defined to suit the user type. What needs to evolve is a learning journey as identified in Figure 2. Even though it has been identified that this is an individual journey affected by not just the users but also but the model headings already discussed there are still common frameworks. These can be used to develop the backbone of a journey, which in turn can be grown to suit specific needs and environments. The model also allows an organisation to place a stake in the ground as a benchmark of where they are, a thermometer reading of knowledge within the organisation. This includes the measuring and valuing of knowledge, understanding the nature of it as a product, then embedding this in products, services and processes. Naturally with the fast passed methods used not only in healthcare but the economy as a whole the value of knowledge can be short lived. The development of methods for its capture, refined and continued currency are therefore a vital part of the methodology.

5.5 Structures

Any organisation will formulate a structure to best suit its function, goals and culture. KM is not merely processes it is the air an organisation breathes. Without it will not survive, organisational developmental, efficiency and competitiveness are lost. An organisation needs to understand where it is. Gone are the days when strategy could be developed as an extension of past practices, strategy now needs to start with a blank piece of paper. This in turn will help determine the structure of the organisation that will support the organisations aspirations, which include its knowledge. Within the organisation the structure needs to develop frameworks that capture, contextualise, transfer, audit, update, delivers within a cycle that continually insures that users enter at the point best suited to their and the organisations needs within that cycle.

The management principle of Joharis window, which is applied in its original context to self-awareness and development in fact, can be applied to an organisations awareness of its knowledge base. There will be areas, which are known to its self, other areas hidden and only known to others etc. The principle of the model allows this analysis to be undertaken within a KM context. Other partner organisations or other departments can provide an insight within the relationship levels identified where unknown information can be identified and shared to provide opportunities for new knowledge acquisition. This process would include mapping exercises of expert networks that may have already been used or have the potential of generating knowledge bases.
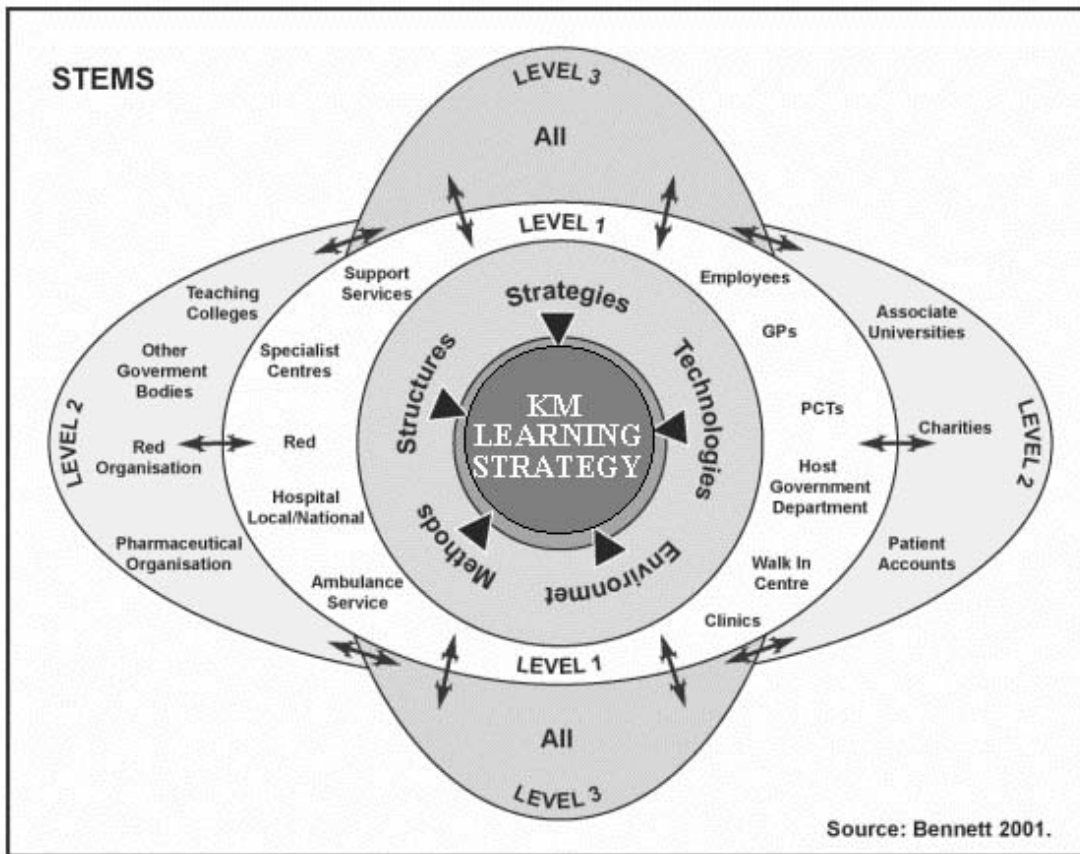
TS2.1 Virtual Academy – Case Studies and Experiences   11/13
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

Figure 3 – STEMS – Healthcare learning Strategy Model (Source Bennett 2001)

6. CONCLUSION

The two case studies undertaken provided a clear contrast in strategy development and planning of e-learning. 'Learn Direct' has benefited from capital expenditure in terms of technology and course material but has forsaken (from the small sample in this survey) the user learning journey dimension. The Higher education case study identifies a reverse of this strategy with smaller amounts of capital being expended but with greater emphasis on the user experience. The model has identified key enablers that need to be facilitated in the development of this experience. The model provides a starting point to correcting organisational strategy, which depicts knowledge as a mere outcome of activities, rather than a tool to determine the activities themselves.

Further research will be undertaken to refine and develop the model by applying the principles in the first instance to other business sectors with the intention of producing a more structured decision making model for board level debate. The pilot research undoubtedly made some mistakes, but this was exactly the purpose of the primary study. The findings are of course, open to criticism from this nature and because of the small (arguable unrepresentative) sample. It has however provided both a framework for further work, and a model for immediate implementation to aid the learning and development process within the

TS2.1 Virtual Academy – Case Studies and Experiences
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002

12/13

defined context of knowledge management strategy related to in the first instance the healthcare economy.

REFERENCES

Allee, V (1197) **The Knowledge Evolution: Expanding Organisational Intelligence** Butterworth-Heinemann

Bernecker, S & Duetske, F (eds) (2000) **Knowledge Readings in Contemporary Epistemology** Armstrong, David.J *The Thermometer of Knowledge* pp72-85 Oxford Univ Press

Bernecker, S & Duetske, F (eds) (2000) **Knowledge Readings in Contemporary Epistemology** Stroud, Barry *Understanding Human Knowledge* pp 307 - 323 Oxford Univ Press

Couldwell, Clive (1999) **Exploiting Your Bright Ideas** Management Consultancy, December pp8 – 11

Davenport, Thomas H. & Prusak, Laurence (1998) **Working Knowledge: How Organisation Manage What They Know** Harvard Business School Press

Demarest, Marc (1997) **Understanding Knowledge Management** Long Range Planning, Vol. 30, pp 374-384

Lloyd, P & Boyle, P (eds) (1998) **Web Weaving: Intranets, Extranets & Strategic Alliances** Butter-Heinemann

Macintosh Ann; Filby, Ian & Kingston, John(1999) **Knowledge Management Techniques: Teaching & Dissemination Concepts** Int. Journal Human Computer Studies 51, pp549 – 566

Rhodes, J. & Thame, S. (1998) **The Colours of Your Mind** Collins

Skyrme. David.J (1999) **Knowledge Networking – Creative Collaborative Enterprise** Butterworth p34

Tiwana Amrit. (2000) **The Knowledge Management Toolkit** Prentice Hall

Wiig, Karl.J. (1997) **Knowledge Management: An Introduction & Perspective** Knowledge Research Inst, Inc.

Williams, Michael (2001) **Problems of Knowledge** Oxford Univ Press

TS2.1 Virtual Academy – Case Studies and Experiences
Tim Bennett
Virtual Learning, Web Based Training and Knowledge Management

13/13

FIG XXII International Congress
Washington, D.C. USA, April 19-26 2002