

6th Annual ALIA Top End Symposium 2009
Library Spaces for Learning and eLearning
2-3 October, 2009
CDU Education Lecture Theatre

Collaborating in the development of an elearning strategy for the Northern Territory Department of Health and Families

Vera Whitehouse and Ann Ritchie, NT Department of Health and Families

Abstract

The Department of Health & Families (DHF) employs around 6000 staff, predominantly health professionals who deliver patient care and develop public health policy and programs in hospitals, remote health clinics, and other community health facilities throughout the NT. Their needs for training and development are diverse, and because of the distributed and remote nature of many of the facilities, delivery of training is complex. Current training methods are varied with some centralised services and limited eLearning capacity.

The Library supports the education/training and continuing professional development of DHF staff in three main ways:

1. providing access to high quality evidence-based knowledge resources;
2. delivering health information literacy training in finding and appraising evidence-based resources; and
3. providing 'quality learning spaces' for study and group learning.

In 2008/09 the authors collaborated in the tender process for a consultant to create an 'eLearning strategy' which would develop the Department's capacity to become a 'learning organisation'; specifically to enable DHF to develop, deliver and manage eLearning programs for all staff within the context of the educational function already existing in various work units and roles.

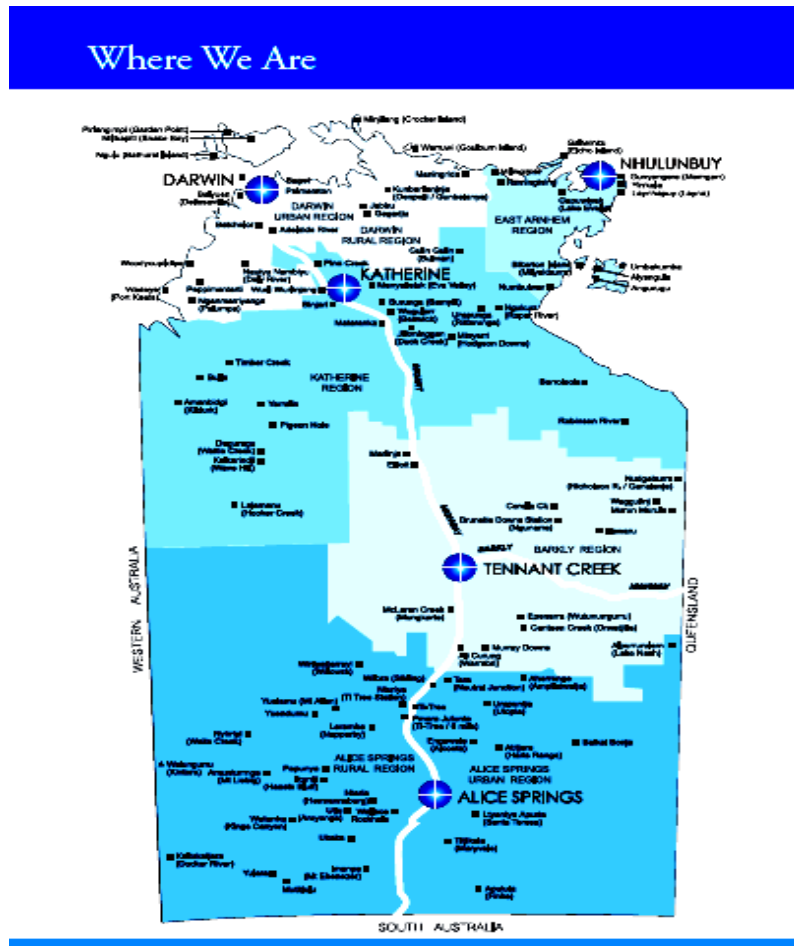
The Australian national health workforce reform agenda is driving changes in health education, and a National Clinical Training Authority has been established, placing a large emphasis on eLearning and simulation training methods. This paper takes into account the national context and other organisational 'change drivers'. The paper describes the process and 'lessons learnt' in managing the tender process, responding to recommendations to develop an eLearning Centre, and designing implementation of the strategy.

Working collaboratively on the implementation of the eLearning strategy, the Library and the Learning and Development Division will support the goal of becoming a 'learning organisation'. The Library's challenge is to integrate its evidence-based resources with a Learning Management System, and to develop training and physical facilities to support eLearning.

Introduction: a snapshot of the Department of Health and Families

The Northern Territory Department of Health and Families (DHF) employs approximately 6000 staff, predominantly health professionals who deliver patient care and develop public health policy and programs in hospitals, remote health clinics, and other community health facilities throughout the Northern Territory.

Figure 1. Locations of hospitals and health facilities in the Northern Territory. (Department of Health and Families, Strategic Workforce Plan at a glance, 2008:8)



As you might imagine, the training and development needs of DHF staff are diverse, and because of the distributed and remote nature of many of the health care facilities, delivery of training is a complex business. Current training methods are varied with some centralised services and limited eLearning capacity. Some examples of the range of the activities which come under the banner of 'training' are:

- clinical supervision for all medical specialties, nurses and allied health professionals for trainee positions, and ongoing CPD support and facilitation for post-graduate and specialist training and maintenance of professional registrations;
- 2-day orientations in all locations for more than 100 new staff per month;
- regular mandatory fire and OHS training in all hospitals (accreditation requirements);

- Alcohol and Other Drugs Cert 3 & 4 training programs for DHF and other organisations' employees (DHF is a Registered Training Organisation for these courses);
- leadership, front-line and middle manager training programs specially tailored for DHF employees;
- emergency and critical care health care training for DHF and related agencies.

With all these varied activities going on across the organisation, you might expect that the education function would be centrally organised. In fact, there is a distributed model of training which is responsive to local needs but may be resulting in duplication of effort. This means that the organisation is not working in a holistic way to improve and develop its workforce, and coordinate efforts to achieve its strategic workforce modelling capability.

The DHF planning context

Education and workforce planning are related concepts, and the need to attract, recruit and retain staff has been identified in all the Department's strategic plans. It is estimated that the current staff turnover rate is about 30%, and the costs associated with this are significant.

Developing the education and training function in DHF, implementing an elearning strategy, and working towards the vision of becoming a 'learning organisation' have been identified as important steps in addressing this need to recruit and retain staff.

There are three main strategic planning documents which establish the workforce, education and information planning context for DHF. These are:

- DHF Corporate Plan 2009-2012, which outlines the activities required to 'Attract, Develop and Retain a Workforce for the Future' in Priority Action Area 6;
- Strategic Workforce Plan 2008-2011;
- DHF Strategic Information Plan 2009-2012, which outlines Strategy 3:

'Provide E-Learning and collaboration capabilities to enhance the ability of the workforce to deliver services', and states: 'The implementation of an eLearning strategy is integral to the Department's capacity to fulfil its educational responsibilities and become a 'learning organisation'. This strategy will provide an integrated and collaborative learning system that will enable staff to maintain and increase their skills and knowledge, leading to improved quality of service to the community.'

In order to implement an elearning strategy, and become a 'learning organisation' the Department will need to develop a more structured and systematic approach to education and training activities.

Definitions

A Learning Organisation is defined as: 'An organisation in which its members, whatever their level or status, are working continuously as individuals or teams to increase their effectiveness and to achieve outcomes about which they hold a set of shared values. This theory, originally applied in the context of large companies, suggests that if the personnel within an organisation are each themselves committed to learning, then that organisation will be the better equipped to adapt in response to constant demands for change...The concept of the learning organisation also involves the idea of continuous improvement' (A Dictionary of Education, 2009).

The following definitions are from Clarke, Lewis, Cole & Ringrose, 2005: 34: **eLearning** is 'learning facilitated and supported through the use of information and communications technologies.' It also encompasses 'blended' learning.

Virtual Learning Environment (VLE) refers to: 'the components in which learners and tutors participate in "on-line" interactions of various kinds, including on-line learning.'

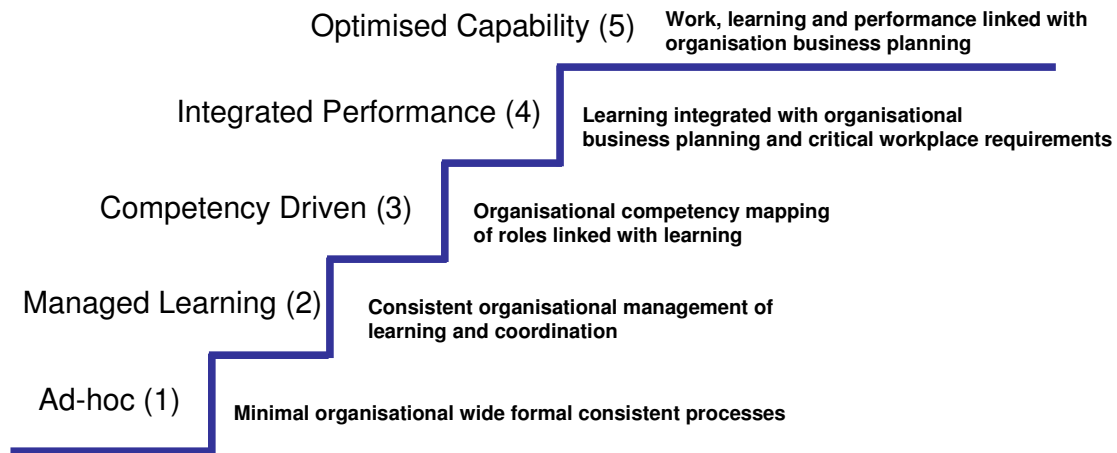
Managed Learning Environment (MLE) incorporates: 'the whole range of information systems and processes.. (including its VLE if it has one) that contribute directly or indirectly to learning and learning management.'

Education, training and elearning in DHF

The main responsibility for education and training in DHF sits within the People and Learning Division, but there are many areas in the Department who deliver training programs and many different combinations of blended learning environments. It would be true to say that in the terms of a popular Learning System Maturity Model, (see Figure 1, in an unpublished consultant's report: *eLearning Strategy Report*, 2009:25) that DHF functions predominantly at an 'Ad hoc' level, in which there is 'minimal organisational wide formal consistent processes', although we hasten to add that some aspects of the system are higher up the scale. We are aiming to take 1 step up the model in the next 12-18 months, to level 2 'Managed Learning' in which there is a 'consistent organisational management of learning and coordination'.

In this model, the progressive steps require increased amounts of coordination and planning, and ultimately DHF aims to reach 'Optimised Capability' at level 5, in which 'work, learning and performance are linked with organisation business planning'. This would enable the Department to achieve health workforce modelling as well as workforce planning and development objectives.

Figure 2 Learning System Maturity Model



The development of an eLearning strategy is one of the first steps we need to take towards becoming a 'learning organisation'. In fact, eLearning has become a **vehicle** to focus attention on coordinating the education function in DHF, and to collaborate in our efforts to maximise resources and pursue funding prospects.

One aspect of this elearning strategy is the implementation of a Learning Management System (LMS) and we know that with the introduction of a new technology, there will be a requirement for change management, as well as communications and training strategies across the whole organisation.

For our planning purposes, and to take advantage of the current opportunities to move up a step in the Learning System Maturity Model, the real need and challenge is to understand how we are going to manage a system-wide cultural change, to move the whole organisation to a managed learning environment, and specifically to embed elearning technologies into the culture of our various learning environments. In an organisation with such diversity of training requirements, this is not likely to be a 'one size fits all' solution.

For the Library the real questions are about our role in elearning and our responsibility in supporting the organisation's education function? – how big a part do we want to play in supporting the system-wide cultural change and the implementation of an elearning strategy? should we be involved in developing and implementing a new Learning Management System, and the move up the scale to a Managed Learning Environment?

Literature review

The library literature contains many articles about education, and there is an increasing focus on elearning and the use of computers and the internet in teaching and learning. This is not surprising as in an 'evidence-based librarianship' framework, education is one of the 6 'domains' of librarianship. This

domain is described as 'finding teaching methods and strategies to educate users about library resources and how to improve their research skills (Booth & Brice, 2004:144).

For libraries in academic and teaching institutions, the focus on education is in direct alignment with the business purpose of their parent organisations, but for other types of libraries, the education domain is just one of the six functions they perform. With the proliferation and popularity of web2.0 resources and collaborative tools as learning resources (for example blogs, wikis, tagging, digital repositories, YouTube, podcasts, social networking sites) it is increasingly the case in all types of organisations that libraries are taking at least some of the responsibility for managing these as 'learning objects' for use in the education and training of employees. And this is certainly true in a competitive health care environment, where supporting staff's training and development is one of the main workforce recruitment and retention strategies.

But what do we know of the effectiveness of elearning? Greenhalgh, in 2003 (cited in Brice & Carlson, 2004:166) stated that much of the research about online learning for health professionals is qualitative rather than quantitative, and provides descriptive and anecdotal information rather than research-based evidence. It is therefore difficult to draw any conclusions about whether elearning is more or less effective than traditional educational designs.

The appendix and bibliography for this paper contain the search strategy and results of the literature review of elearning in health/medical libraries, and we will outline the findings of two systematic reviews of the literature and one review article in order to highlight the implications for libraries.

With regard to the key issue of effectiveness of elearning, Booth et al (2009:5) stated:

Indeed, if there is little to separate face-to-face and e-learning modes of delivery with regard to impact and cost, as many suspect, then the quality of the student experience becomes paramount.

This systematic review of work-based elearning (WBEL) is important because it focuses on implications for the quality of the student experience. It analysed the results of 29 studies, noting that the twin barriers of 'lack of time and geographical isolation' were encountered by many in the health services. The findings about the quality of the learner's experience are presented in five broad themes: course presentation and design; flexibility; peer communication; support; knowledge validation. (These were further divided into 11 sub-themes which crossed boundaries of the main themes.)

The implications for librarians who are involved in elearning and wish to improve the quality of elearning offerings related primarily to the flexibility, course

presentation/ design, and support and knowledge validation themes. These are outlined in the section Implications for Policy (p. 18), in which it is stated:
important considerations for librarians involved in designing and developing WBEL include learner control, applicability, formal support and innovative methods of assessment.

The results of a second systematic review (Childs et al, 2005) describe a number of the barriers to elearning and some solutions are discussed. This review identified 57 studies focused on elearning for health professionals and students, and the study was supplemented by a survey of learners and interviews with training providers.

The main barriers identified were: requirement for change; costs; poorly designed packages; inadequate technology; lack of skills; need for a component of face-to-face teaching; time intensive nature of elearning; computer anxiety. Some of the solutions suggested are: standardisation; strategies; funding; integration of elearning into the curriculum; blended teaching; user friendly packages; access to technology; skills training; support; employers paying elearning costs; dedicated work time for elearning.

They also make some suggestions about the roles that librarians can play in supporting elearning, primarily in the provision of online learning materials and packages, and teaching information skills.

The article by Bury et al 2006 builds on the Childs' review, noting that this found that 'overall, e-learning was effective, but that it is dependent upon the way it is implemented and the attitude and skills of the learner' (p. 24). This article is interesting because it reviews collaboration within the higher education and national health sectors in the UK, in supporting online learning and the impact on role development for staff in the areas of academia, libraries, and learning technology. The authors suggest that the NHS health librarians are likely to be viewed as 'knowledge mobilisers', whereas in the academic sector, subject librarians are more often described as a 'learning facilitators'. It also notes that in UK, Australian and US studies, the latter group are 'depicted unanimously as at the forefront of change and role development'. The changes are categorised (p. 25) as having:

- a more proactive approach to academic liaison
- a role in delivery of learning and teaching, particularly information literacy
- a role in skills development for technology-related change
- a move towards more strategic alliances and partnerships

It can be concluded from this review that there is a range of services and roles which support elearning in universities, and health librarians have some role development to undertake to become involved in the 'new elearning development units'. With regard to the changes needed to move towards strategic alliances and partnerships, they quote Laurillard (2002): 'collaborative development is

crucial for learning technologies because of the range of skills needed.' There is a clear need for us to take up this challenge in a new Managed Learning Environment.

The Library's role in education and elearning

In a recent client survey conducted in June 2009, our members rated our services and resources according to their perceptions of how important they were to them, and four of the top ten of these were accessed or used for the purposes of education and training. And from a Library perspective, I would hazard a guess that at least 50% of our work and usage goes towards supporting this function. The answer to the question should 'we be involved in the education function and the implementation of the elearning strategy at DHF?' is unequivocally 'yes'.

Currently the Library supports the education/training and continuing professional development of DHF staff in three main ways:

1. providing access to high quality evidence-based knowledge resources;
2. delivering health information literacy training in finding and appraising evidence-based resources; and
3. providing 'quality learning spaces' for study and group learning.

The Library's challenges for the future are to:

1. Integrate library resources ('learning objects') within the Learning Management System
2. Develop information literacy training in the elearning environment
3. Develop physical and virtual 'eLearningLibrary/Centre'
4. Develop collaborative partnerships and develop roles by becoming involved in the 'new elearning development unit'.

Collaborative approach in DHF in the elearning consultancy

In 2009 the Northern Territory Government (NTG) and DHF contracted the services of a consultant to develop an elearning strategy for the Department. There were several key partnering relationships that were developed for the purposes of managing the elearning consultancy and these were formalised with establishment of a steering committee that was responsible for overseeing the project. The group consisted of:

- Organisational Learning
- IT specialists
- Library services
- Executive representation
- Across government representation, as the consultancy was funded through the NT government's push for ebusiness solutions.

The steering committee's adoption of a collaborative approach enabled several critical success factors to be achieved:

1. Key stakeholders had an opportunity to inform the direction of the consultancy
2. Regular communication was facilitated through this forum
3. Key stakeholders felt empowered as they had a voice through the steering committee.

Background and business drivers for the elearning consultancy in DHF

DHF maintains a number of individualised systems to manage the development, delivery and reporting of education and training activities across the Department. These systems are currently not linked to each other, and their disparate nature and low level of data integrity residing within them mean that governance, reporting and interrogation of learning and development data are difficult to maintain and track. DHF is now analysing options for implementing an integrated and flexible eLearning Strategy, which must be able to cope with a changing and dynamic business environment and meet the strategic business drivers of the Department.

This section identifies the audience, drivers, requirements and challenges as the Department considers the implementation of the eLearning Strategy.

Target audience

The Department has an increasingly complex requirement to deliver education and training to a diverse workforce. The main characteristics of the target audience of eLearning in DHF can be defined as follows:

- Internal Departmental staff

All DHF staff will have access to all training resources and the LMS. The Work Partnership Plan (Performance management tool) can also be integrated with the LMS.

- External audience

There will be external participants (i.e. not an employee of the Department) who will need to access the eLearning Management System (LMS). For example, the National Critical Care Trauma Response Centre is required to train Defence and Military personnel.

- Geographically Dispersed Locations

The participants of eLearning in DHF will be located in geographically dispersed locations (e.g. urban, rural, remote area and overseas).

- Language and Cultural Diversity

DHF employs staff from very diverse cultural and linguistic backgrounds including overseas trained and Indigenous staff.

- Wide Range of Literacy levels

The participants of eLearning in DHF will have a wide range of literacy levels depending on their cultural background, educational experience, job functions and other demographic characteristics.

- Skill Variance (computer skills and job-related skills)

DHF staff have different levels of computer skills and are employed across a wide range of job roles.

As noted in the introductory section, DHF has a variety of ways of providing education across the Department to these diverse groups, and the implementation of an elearning strategy would enable a more holistic approach.

The main drivers for a coordinated training environment

These fall into a number of key areas covered under the headings of corporate, HR and training, and operational business drivers.

Corporate business drivers

In order to protect, grow and invest in the Department's staff, and therefore the Department's capability, a more effective and efficient training environment is necessary. The corporate business drivers are:

- Connect knowledge and capabilities to Department business objectives
- Assurance surrounding legislative requirements
- Developing workforce flexibility and adaptability
- Integrated learning and development reporting and data integrity

HR and training business drivers

All learning and development activities across DHF must have clear and consistent corporate direction. The systems used to manage training are to be integrated and interconnected to each other to increase efficiency and reduce duplication of work. This will allow effective transfer of a person's learning history and capabilities when they change job roles or positions.

The key HR and training business drivers are as follows:

- Integration of training curriculum to work partnership plan (WPP)
- Efficient resource management
- Simplified training management
- Greater levels of training and assessment data collection
- Increased productivity and staff retention
- Single point of training resources
- Increase and promote intellectual capital development and knowledge sharing
- Increased training availability and accessibility
- Compliance training

Operational business drivers

The majority of key business drivers from the operational point of view are based on the requirement that all learning products are quality assured, mapped to job roles of each Division and Branch. This will support operational efficiency by ensuring that the skills, knowledge and capabilities of each employee of the Divisions and Branches are up-to-date and relevant to their work areas.

- Removing duplication of work

- Clear training and development direction and career development pathway
- Staff and managers are accountable for completing learning
- Reduced costs and time away from the job
- Consistent and flexible training delivery

Scope of the eLearning Consultancy

The NTG and DHF contracted the services of a consultant to develop an elearning strategy covering the following:

- policy framework for overarching issues of governance, policies and guidelines surrounding the development, management and delivery of eLearning;
- identification of requirements for the establishment of an eLearning Centre;
- identification, analysis and appraisal of an LMS and eLearning tools;
- implementation plan.

There are significant inputs into the implementation of an eLearning Strategy to be considered. The scope of this eLearning Strategy includes:

- analysis of the Department's current training development, delivery process and infrastructure, and defines the Department's eLearning requirements for short, medium and long term delivery;
- analysis of technical, service/transaction and other functional requirements required for implementing a state-of-the-art Learning Management System (LMS);
- feasibility analysis of implementing an eLearning Centre to allow centralised area of advice and assistance regarding the development, delivery and management of eLearning programs;
- eLearning tools recommendations, and resources available for the Department to enhance the delivery of various education and training within in the Department;
- overview of methods and planning for the implementation of the eLearning Strategy and an LMS;
- provision of a baseline governance strategy, policy and guidelines for training and development (which is provided in the eLearning Governance, Policies and Guidelines document); and
- investigative options for an eLearning system and LMS products that meet the requirements of the Department (including business and ICT requirements) including estimation of effort, cost and proposed schedule for the implementation of the options provided.

Expected Departmental benefits

The implementation of an eLearning Strategy will allow the Department to realise the following benefits:

- an integrated eLearning system that links the Department's business processes, human resources and training, which will in turn complement NT's ICT and e-health strategy in delivering world class indigenous health services, linking education, research, policy and service provisions by 2030;
- provide access to all departmental training for staff located in central and geographically dispersed locations;
- provide education and training that supports staff from diverse cultural, linguistic and demographic backgrounds;
- support DHF to be self-sufficient in producing the workforce the Department requires;
- provide beneficial reallocation of resources, reduction in cost, increased availability and flexibility of education and training, consistent information delivery and efficient reporting;
- provide flexibility and greater choice for staff to assist them in selecting a career path that matches various stages of their working lives; and
- maximise the automation and ease of coordination, administration, management and reporting for education and training activities.

As part of the eLearning consultancy, interviews and focus groups were conducted with departmental staff to identify the current and future requirements of training administration, delivery and reporting activities. It was identified that the Department's eLearning Strategy would need to concentrate on increasing effectiveness and responsiveness.

Key recommendations

The key recommendations contained in the eLearning Strategy report are that the Department:

1. undertake a phased approach to the eLearning Strategy implementation over a period of three years;
2. conduct a whole of life cost benefit analysis;
3. instigate a governance structure for the eLearning Strategy, LMS implementation and ongoing operations;
4. develop governance, policy guidelines and standards to support the eLearning Strategy and the LMS;
5. setup an eLearning Centre for the operational support of the proposed eLearning Strategy; and
6. develop and implement a change management, communication and adoption strategy for the implementation of the eLearning Strategy and an LMS.

Conclusions and lessons learnt

The following points are some of the 'lessons learnt' from the experience of collaborating in the development of an elearning strategy.

The first 3 set the strategic context, they are the main environmental drivers; the following 4 relate to the process of managing the consultancy and implementing the outcomes; and the final 'lesson' refers to the theme of collaboration.

1. Alignment with Northern Territory and Australian Government agendas

eGovernment, '20 towns', and Digital Regions Initiative are all on the NT and Australian Government agendas.

The NTG push towards eGovernment allowed us to take part in a consultancy which researched requirements for eHealth and eLearning; the '20 towns', and Digital Regions Initiative have enabled us to submit a successful Cabinet submission, allowing us to match funding if we are successful in our bid for DRI funding for the first 3 years of our eLearning strategy.

2. Alignment with Departmental strategic plans

The 3 significant DHF strategic plans outline strategies for workforce development, workforce education and training, and eLearning as a strategy for becoming a learning organisation; as DHF plans, all divisions have agreed to support the actions which will achieve these goals.

3. Executive and senior management involvement

Executives and senior management have signed off and authorised the actions for implementing the Department's strategic plans.

This provides funding approval from divisions' and branches' budgets – difficult to obtain when the 'pie' is being divided up, and corporate services areas i.e. education and information services, don't take priority over patient care service delivery areas.

4. Scoping the requirements and outcomes

The objectives (what you're trying to achieve) and the outcomes (deliverables) need to be clearly defined – otherwise you might not get what you think you might want.

A couple of practical ways of achieving this:

- Provide a report template where the content and key editorial to be covered under each heading are identified and agreed upon.
- Identify and ensure the consultants report on key milestones. This will enable you to keep track of the progress and identify issues early in the piece. One suggestion is to allow sufficient time to review the draft reports. In some agencies there are a number of people who need to comment on the draft report and it's important this component is not rushed. Our suggestion is to at least allow 2 weeks for this process.

5. Stakeholder consultation

As part of the Scope of requirements map out your stakeholder consultation plan. The plan should identify name, role, why they are important to the consultancy and how long the consultation should be. This will ensure that the consultants cost the stakeholder consultation out accurately and ensures that all the key stakeholder have provided important information to inform the consultancy.

6. Get everything in writing

When you are dealing with the consultants get any change or agreed action in writing; consultants may make verbal promises in the beginning of the consultancy that in some cases are not for filled.

7. Implementation and sustainable support structures

it's important to note that it's not just about implementing an IT system - implementation of a Learning Management System (LMS) is only one aspect of the whole elearning strategy - we know that with the introduction of a new technology, there will be a requirement for change management, as well as communications and training strategies across the whole organisation. And this has to be factored into any funding proposals, business cases.

8. **Collaboration** means bringing together complementary perspectives to implement a shared vision – there are often different ways to achieve the same end, and working collaboratively can make the journey a better one.

We had a shared goal to implement an eLearning strategy in DHF in order to coordinate the education function and create a learning organisation.

Collaboration requires a unified vision, and commitment to working together to achieve goals – otherwise you can be talking at cross-purposes, trying to accomplish different things.

Bibliography

Beaumont, A. Implementation of e-learning and the teaching hospital: a local perspective. *Health Information and Libraries Journal* 2005, **22** (Suppl. 2), 66-70.

Booth, A., Carroll, C., Papaioannou, D., Sutton, A., & Wong, R. Applying findings from a systematic review of workplace-based e-learning: implications for health information professionals. *Health Information and Libraries Journal* 2009, **26**, 4-21.

Booth, A. & Brice, A. The six domains of evidence-based information practice. In: Booth, A. & Brice, A. (eds). *Evidence-based Practice for Information Professionals: a handbook*. London: Facet Publishing. 2004, 144-147.

Brice, A. & Carlson, C. The contribution of evidence-based practice to educational activities. In: Booth, A. & Brice, A. (eds). *Evidence-based Practice for Information Professionals: a handbook*. London: Facet Publishing. 2004, 164-177.

Bury, R., Martin, L. & Roberts, S. Achieving change through mutual development: supported online learning and the evolving roles of health and information professionals. *Health Information and Libraries Journal* 2006, **23** (Suppl. 1), 22-31.

Childs, S., Blenkinsop, E., & Walton, G. Effective e-learning for health professionals and students – barriers and their solutions. A systematic review of the literature – findings from the HeXL project. *Health Information and Libraries Journal* 2005, **22** (Suppl. 2), 20-32.

Clarke, A., Lewis, D., Cole, I., & Ringrose, L. A strategic approach to developing e-learning capability for healthcare. *Health Information and Libraries Journal* 2005, **22** (Suppl. 2), 33-41.

Department of Health and Families. *Corporate Plan 2009-2012: healthy Territorians living in healthy communities*. 2009. Northern Territory Government: Darwin. <http://hdl.handle.net/10137/342> Accessed 18/9/09

Department of Health and Families. *Strategic Information Plan 2009-2012*. Northern Territory Government: Darwin. <http://hdl.handle.net/10137/358>

Department of Health and Families. *Strategic workforce plan 2008-2011: working together to strengthen our workforce*. 2008. Northern Territory Government: Darwin. <http://hdl.handle.net/10137/343> Accessed 18/9/09

A Dictionary of Education. Ed. Susan Wallace. Oxford University Press, 2009. *Oxford Reference Online*. Oxford University Press. Northern Territory Department of Health & Families. 19 September 2009 <http://www.oxfordreference.com.www.ezpdhcs.nt.gov.au/views/ENTRY.html?subview=Main&entry=t267.e548>

Morris, D. E-learning in the common learning curriculum for health and social care professionals: information literacy and the library. *Health Information and Libraries Journal* 2005, **22** (Suppl. 2), 74-80.

Sheffield, C. eLearning object portals: a new resource that offers new opportunities for librarians. *Medical Reference Services Quarterly* 2006, **25**, (4), 65-74.

SMS Management & Technology. *eLearning Strategy Report*. Northern Territory Department of Health & Families. Darwin, Northern Territory. 2009. [unpublished report]

Tse, M. M. Y., Lo, L. W. L., & Chan, M. F. The use of health technology and information: e-learning technological approach. *CyberPsychology & Behavior* 2007, **10**, 821-826.

Appendix 1 Search Strategy

Key Concepts

Search 1: Library literature

health AND (elearning OR e-learning OR "blended learning" OR "virtual learning environment" OR "online learning" OR "web based learning")

- Limit to last 5 years

Search 2: PubMed

'e-learning OR elearning' (Title/Abstract) and 'review' (Publication Type)

Synonyms/Keywords

e-learning, eLearning, online learning, blended learning, virtual learning environments, web-based learning, online learning environments

Sources Searched and Results

Search 1: Library literature

ProQuest, LISTA, Medline, ScienceDirect Journals, Wiley Blackwell Journals = 29 articles
(Includes 2 systematic reviews)

Search 2:

PubMed = 51 articles