

KNOWLEDGE MANAGEMENT FOR eLEARNING #530

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Abstract *¾ Online learning or elearning is now viewed as the ‘holy grail’ by many universities. Moving course materials to an online delivery mode is seen to be one way of extending the services provided to students while reducing the costs of education. As a result of this trend, academic knowledge is undergoing a change especially in teaching and learning practices. Academics are now required to be the managers and facilitators of this change, necessitating a more strategic approach to knowledge management. This paper outlines a grassroots approach to curriculum planning and delivery, in which university staff are provided with the opportunity to develop elearning courseware in a collaborative environment. The knowledge gained by academics will be shared amongst the university community.*

Index Terms *¾ knowledge management, elearning, curriculum planning and delivery.*

INTRODUCTION

Universities have always been in the business of knowledge. Over the years, they have developed methods and processes and established organisational units in order to acquire, select and distribute information on an organisation wide scale. However, in recent years the rapid and ongoing developments in technology have increased the demands on access to this information, impacting on academic knowledge and its dissemination in particular. Universities have had to rethink their role as competition for students has increased (and not just from other universities) and funding levels (in Australia) have decreased. Economic factors are seen as the key reason why universities are wholeheartedly embracing the move to elearning as they try to control costs, increase services, develop lifelong learning and utilise interactive multimedia.

Although the “primary missions of the university – the creation, preservation, integration, transmission and application of knowledge – are not changing” [2], the rapid proliferation of the internet-based courses means that new approaches to teaching and learning are required. As the student population is now increasingly diverse (and dispersed), academics seek resources which support their evolving roles, enabling them to deliver education which is both technologically mediated and andragogically appropriate. This education is interactive, can be accessed at a time of students’ own choosing and provides a wealth of material not usually available in more traditional teaching environments. This change to teaching and learning approaches has meant that academics are now more

designers and facilitators of the educational experience and less transmitters of information. Different ‘products’, that is, course materials are produced which become knowledge assets of the university. The collective nature of education, mediated by the Internet now requires universities to devise new and efficient ways of managing these ‘new’ knowledge assets.

Knowledge management

Knowledge management in the context of this paper refers to the organisational activities that promote effective use of available knowledge and the effective development of new knowledge [3]; [5]. Peter Drucker [1] introduced the term ‘knowledge worker’ in his writings of the 1950s. He predicted the need for a management technique to consciously develop a support structure for recording and retaining intellectual assets and the need to be flexible in the face of a gathering pace of change for the workforce.

In some sectors, knowledge management is regarded as a technology only, and that knowledge is managed if an electronic repository is built and accessible to everyone. Whiting [10] states that knowledge management is not the same as data warehousing or data mining and that for knowledge management to be effective it must be about “people, relationships, communities and a new way of working”. While both technology and social relationships are critical for effective knowledge management, the key is providing ways for workers to use their experiences to transform the data collected into knowledge. This may mean the development of a knowledge management system, for example, which is predicated on the assumption that knowledge is distributed through a network of people, that only a small proportion of it is captured in concrete form and that the system provides access not only to creators of knowledge, but to people who access and use the knowledge [4].

What does this mean for universities?

A university is, by its very nature, a knowledge institution, and many of its traditions (collegiality, autonomy, peer review, tenure etc) are based on effective management of knowledge. The nature of university knowledge is changing; roles and processes are moving from the “sequential, pyramid approach of the typical university curriculum” to ‘plug and play’ experiences, much of which is delivered online [2]. eLearning generates assets which have received little attention in the past. Today these assets

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are now regarded as a marketable commodity and their preservation is of prime importance to the university.

Ruggles [9] identifies the following as integral activities of knowledge management:

- Generating new knowledge
- Accessing valuable knowledge from outside sources and using that knowledge in decision making
- Embedding and representing knowledge in processes, products (documents, databases and software), and/or services
- Measuring the value of knowledge assets and/or impact of knowledge management
- Facilitating knowledge growth through culture and incentives and transferring knowledge into other parts of the organisation.

These activities are undertaken by universities today as they move towards a knowledge community and a different type of learning organisation. A change in the knowledge culture of universities, one which has a focus on elearning, requires a new blend of resources, interactivity, performance support and structured learning activities.

A knowledge community needs to be built with collaborative activity at the heart of it; where the engineering faculty may collaborate with the health science faculty or the law faculty with the teacher education faculty. Rewards for performance such as promotion or tenure need to be reviewed in the light of outcomes rather than output; quality teaching must be valued in the same way that universities value quality research.

Creating a knowledge community cannot be done overnight. The challenge for universities, according to a recent report [6] is to develop “more holistic knowledge management strategies which go far beyond the preparation of annual publication lists, the promotion and support of research grant proposal preparation etc. Librarians can play a leading role, at the centre rather than at the margins of the university, in formulating and articulating such strategies”.

However, this statement does not articulate what is required at the grassroots level. According to [8], it is the academics who “must be at the heart of this [knowledge] transformation, acting as ‘knowledge managers’ in a new structure that transcends time and space in order to serve a broader and more technologically-savvy constituency”.

For academics to be the ‘knowledge managers’ in universities, strategies and support mechanisms must be put in place which enable the experts to expand their horizons and the novices to become competent and confident. Mentoring and peer collaboration, the linking of experts with novices and the sharing of experiences across disciplines can all contribute to the redefinition of the university as a learning organisation.

ONE UNIVERSITY’S EXPERIENCES

In Australia, universities have embraced the concept of flexible learning, a term which is often used synonymously with online learning or elearning, but is much broader. The author’s university, Griffith University’s *Teaching and Learning Management Plan: 1999-2001* identifies flexible learning as one of its four key areas for strategic development with individual faculties and elements nominating targets for the long-term integration of flexible learning. The strategic aim of the University is to position itself as an institution that uses communication technologies to enhance student learning; using the technologies alongside key teaching practices involving personal interaction, setting learning goals and providing critical feedback. An example of the University’s commitment is the development, over four years ago, of a flexible learning environment at the University’s newest campus of Logan. The campus has been built from the ground up to provide an exemplar of flexible learning in tertiary education. A major component of this learning environment is the development of flexible learning resources for each of the 250 subjects on offer.

This initiative has now been extended to all five campuses, which are in three cities, with over 100 kilometres separating the two most distant campuses. The University has 25000 students and 1200 academic staff. Some staff teach on two campuses and intercampus travel is commonplace. Sharing knowledge about new ways of teaching and learning can be difficult due to the time and distance constraints. Academic elements (schools, faculties) have tended to ‘do their own thing’ and the wheel is quite often reinvented. The University has taken the position that a knowledge community is developed by people sharing their knowledge and engaging in interactions which makes innovations more visible to the wider university community. An example of knowledge sharing has been instituted in a series of seminars, held on a different campus each time, with the theme of Celebrating Teaching. However, while these seminars, and other strategies, have proven to be effective, they are attended by only a handful of academics and do not reflect the breadth and depth of innovation or activity in the development of online curricula.

A grassroots perspective

Capturing best practice, harnessing collective intelligence, sharing lessons learned and making explicit the tacit knowledge of academic staff are challenges facing universities. Many universities view the establishment of mechanisms for capturing and sharing knowledge which are integrated into the organisational framework [11] as a costly and time-consuming activity. It need not be.

Coordination can occur at the highest levels of the university, but the management activity can be facilitated by academics at the grassroots level.

Academics teaching in three different degrees (Bachelors of Multimedia; Internet Computing and Information Technology) in a computing and information technology school collaborated on a process which (a) provided explicit guidelines for the development of quality elearning materials, (b) identified strategies to enable the knowledge gained to be shared across the wider university community and (c) provided support for both novices and experts in the development process. While the planned outcome was the development of quality elearning curricula, the underlying focus was on making explicit the tacit knowledge of the academic staff. The initial aim was to address the academic needs in terms of curriculum development and provide tools and templates to support their learning and performance.

Early (and innovative) adopters of online learning were linked with novices who were seeking new approaches to elearning. In the past, each of the academics had developed elearning with varying degrees of quality in terms of the instructional and interface design and level of interactivity. A more systematic and cohesive approach to the curriculum planning and development was required as the elearning was to be delivered in an international location by local tutors who would not have immediate access to the academic staff for assistance. The process needed to be carefully documented so that (a) it could be used as a guide by other academics and (b) so that it could be evaluated in terms of efficacy and quality outcomes.

The management structure implemented during the initiation phase of the project encompassed a three-tier hierarchy led by an expert panel of three senior academics who were also curriculum developers. Responsibilities of the panel included the procurement of computing resources (hardware and software), and the employment of casual

personnel (academic support staff, researchers, web designer, animator, and programmer). Tiers two and three of the management hierarchy comprised the current subject convenor and the teaching team members as well as a web developer and researcher.

The panel, subject convenor and teaching team members undertook a collaborative review of existing course content within the context of reviewing and evaluating current subject resources, determining instructional design paradigms and specifying educational objectives and outcomes for the elearning materials. Figure 1 illustrates the knowledge management processes used as the basis for the development of the elearning courseware.

The learning support needs of the student population were examined by the panel, the subject convenor and the teaching team and support staff, and students in some instances. A single academic in isolation usually determines these support needs. In this case, the team reviewed the learning support needs in terms of:

Modularisation

What are the most appropriate content chunks that can be presented over the course of a 14-week semester?

Course entry and exit times

Can students enter the course or subject at any point in time?
Is the subject only to be offered in one particular semester?
How will this work with the student administration system?
Can students accelerate their progress?

Pace of learning

What do students consider is the most appropriate pace of learning? How can different levels of knowledge and styles of learning be accommodated?

Methods of assessment

Will current assessment methods need to change? To what extent could problem-based assessment be utilised?

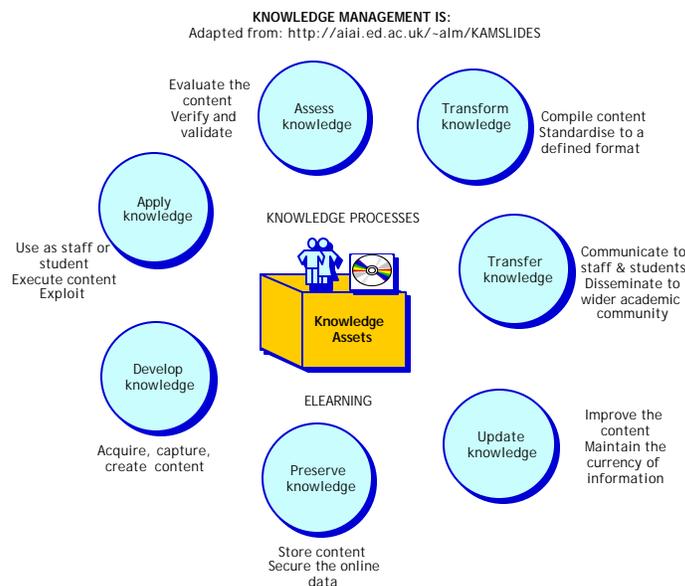


FIGURE 1
KNOWLEDGE MANAGEMENT PROCESSES FOR ELEARNING

Opportunity for interaction between participants and facilitator

What technology is required to facilitate interaction? Will interaction be synchronous or asynchronous or both? Will (virtual) noticeboard, listserv, chat, video or teleconferencing, fora, or a combination of all be implemented?

Use of communication technology

Will students have the appropriate technology? Should it be mandatory to purchase the technology in order to access the subjects?

Increased access to learning resources

What other resources are available to the students or elsewhere? Can a number of similar subjects be collapsed into this one?

Feedback on work in progress

What level and type of feedback is required - written, oral, combination?

Once the learning support needs were documented, the next stage was to determine the level of information and interactivity provided in the elearning courseware. The levels were to be initially determined by the subject matter, but the final courseware was a mix of Level 2 and Level 3.

Level 1 – Take what is currently used – for example, notes, Powerpoint slides and put the content on the internet with little change. At this level, complete information on the subject is provided, including links to

relevant sites and some online tutorial activities. The material would also include information on the lecturer such as email contact, office hours if appropriate, the number of lecture and tutorial hours, the subject description (which would also include learning outcomes and assessment), and the semester schedule. Interactivity is limited.

Level 2 – The content is chunked to reduce use of scroll bars to encourage engagement and an attempt is made to go beyond text and still images on screen – some simple animations are included. A forum and some online quizzes may be provided. All class outlines, notes and assignments are posted and all lecture materials are available for students to pursue/review outside of class. Students may also be required to post some, or all, of their assessment or other work on the web or by email.

Level 3 – Interactivity, reflection and problem solving are now the key attributes at this level in an endeavour to establish a much greater focus on a collaborative learning environment and to extend and/or shift the classroom discussion to a computer based medium – use of a forum is totally integrated and structured to be an integral component of the elearning content. Visual enhancements may be provided through the use of audio and/or video, either online (streamed or archived) or in supplementary computer media formats (such as CD-ROM, DVD, etc.).

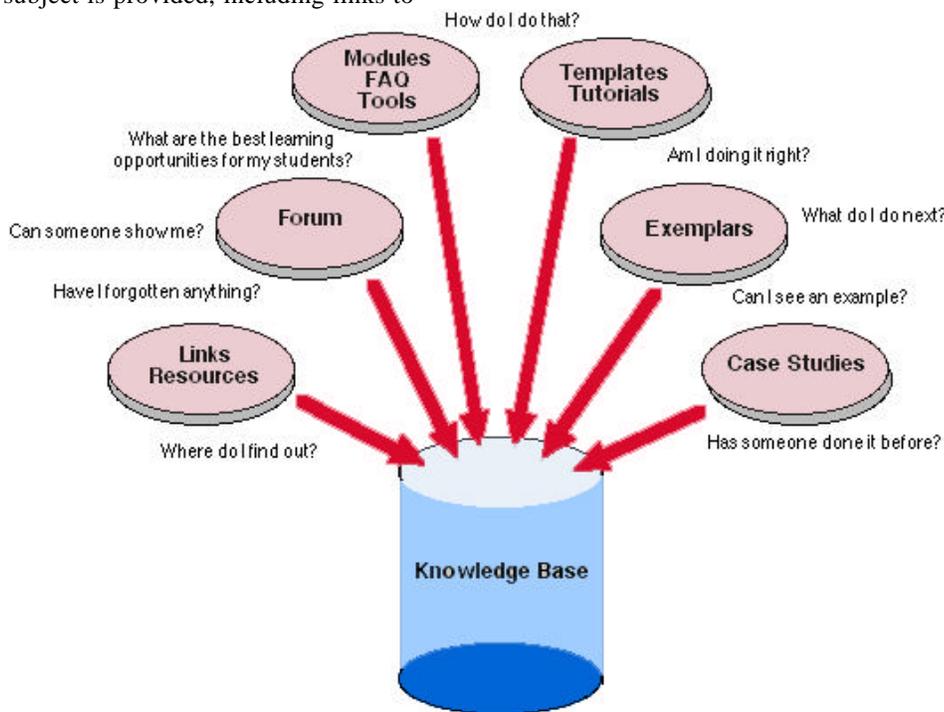


FIGURE 2
THE KNOWLEDGE BASE

A knowledge base (an electronic repository) was established and is shown in Figure 2. This knowledge community of academics in similar discipline areas, spread across two campuses, became an online workplace. A wide range of knowledge processes (see Figure 1) required coordination. Information needed to be shared across all tiers of management, between the web developer, the researcher and the academics. All of the team had access to templates or exemplars to both guide and support the process. Significant changes were acknowledged in a formal manner by all members of the team.

If required, staff members were guided through the selection of modes of delivery and the educational design and development of the materials. They were able to query the knowledge base at key points (see Figure 2). Explicit options were presented to assist the novices with the establishment of goals and learning outcomes. Extrinsic and/or intrinsic resources in the knowledge base helped to compare and contrast goal options and consequences.

The academics provided the content in print form to researchers who divided each subject into 14 modules (one module for each week of the semester). Learning outcomes for each module were developed as was a flowchart (see Figure 3) which provided an overview of the content and the linkages between the key concepts.

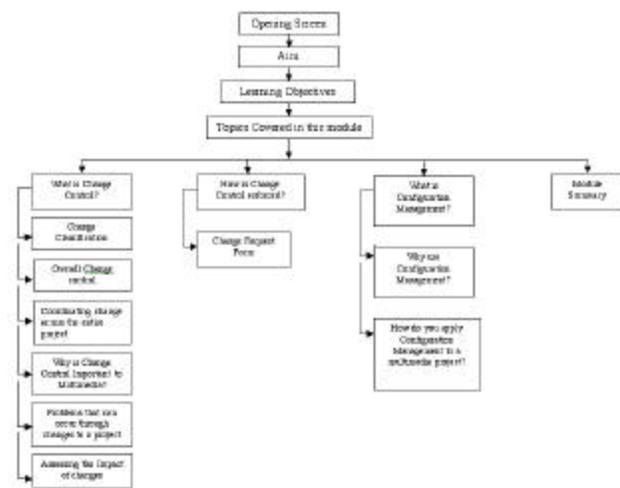


FIGURE 3
MODULE FLOW CHART

Once the flowchart and learning outcomes were approved by all members of the team, storyboards for each screen were designed. The storyboards (Figure 4) showed the text, a rough design or description of any animations or video and/or a thumbnail of graphics or web sites. The storyboards were revised based on

feedback (and this was also documented) and resubmitted until approved.

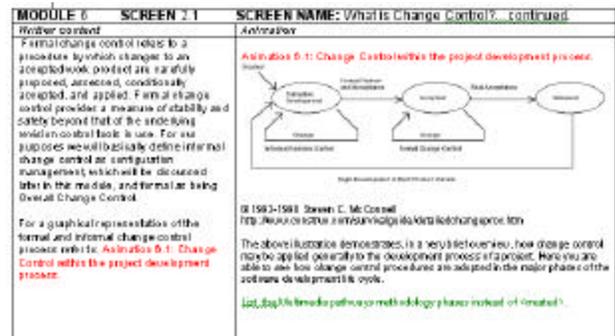


FIGURE 4
STORYBOARD EXAMPLE

The academics on the team still had their usual teaching and other commitments so the value of the iterative process, which was documented and included in the knowledge base, has become apparent as further subjects are developed. Reinventing the wheel has reduced, the knowledge base has expanded and is now being shared across various sectors of the university.

CONCLUSION

The curriculum planning process briefly described in this paper may appear simplistic but it enabled novices in learning to become more confident as they worked in the team environment. The support services of the university are already overwhelmed by the volume of subjects to be repurposed for elearning. This project supported the knowledge management strategies of the university, extended the number of online subjects and provided a knowledge base which can now be added to by other academics.

The purpose of this small project was to assist the academics to such an extent that "they try and *succeed* at challenges that stretch their capabilities and grow their experience base" [7]. Supporting teaching and administrative staff in this way is critical if the intellectual capital of the university is to expand and become useable, that is, it is accessible to the university community and is represented in such a way that it is useful to staff. Knowledge communities, based on academic elements or like-minded individuals, for example, can be established either in a formal or informal manner. The ideas, strategies, activities and problem solving promulgated by the community are then incorporated into the knowledge base.

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