

# Communities of Practice in Adult Learning, the Byron Knowledge Management Project

Mitra Ardron, Southern Cross University, [mitra@mitra.biz](mailto:mitra@mitra.biz); [www.mitra.biz](http://www.mitra.biz)

Jim Nicholls, Principal ACE North Coast [jim@acenc.com](mailto:jim@acenc.com); [www.acenc.com](http://www.acenc.com)

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## Executive Summary

We live in a world, which is changing rapidly, and as it changes the need for new knowledge, and therefore for learning, expands at an even greater pace. The methods that we use to teach now, i.e. periodic courses, cannot hope to meet the learners requirements to learn exactly what they need to know, at the time they need to know it. How will Adult Learning in Australia innovate and grow to meet those needs?

Our work in Knowledge Management related to the ACE sector has led to some re-thinking of the ACE paradigm. In recent years the agenda has been captured to a large extent by vocational training. This has led to many improvements in re-thinking course directions and quality issues but it has meant that the ACE mission has been more and more about courses. Other historic ACE missions such as Basic Education, Education for Social Justice and Community Development have been overshadowed in the process. Knowledge Management and Communities of Practice give us a new opportunity to think again.

Knowledge Management refers to the cross-disciplinary processes that help with the management of information, wisdom, and skills in this changing environment. From its origins in Data Mining huge collections of inaccessible data, the discipline has evolved to recognise the key importance of Tacit information, that is present only in people's heads, and is hard to turn into organised written form.

Communities of Practice offer one opportunity for ongoing lifelong learning in a changing world, bringing people together across organisational and sectoral boundaries to share information and experiences.

Adult Learning can make use of Communities of Practice (CoPs) in many ways, partly as extensions of traditional course-work, allowing students to interact before, during and after the classroom learning. CoPs can also provide more innovative opportunities to encourage learning with people who are not part of any formal learning environment.

The Byron Knowledge Management Project is exploring these ideas through a BVET funded pilot project to create five Communities of Practice in 2003, across different economic sectors, from Sustainable Agriculture, through Event Organisers to Professional Artists. Each CoP has a slightly different approach to maximise the opportunities for generalisations and innovation. An interactive web site is online at [www.byronkm.com](http://www.byronkm.com)

# Introductions

The Byron Knowledge Management Project is managed by Mitra Ardron, and is a project of ACE Training Network. The project is funded by NSW BVET.

Mitra Ardron founded GreenNet in 1985, one of the earliest on-line community networks, and has been active in online communities, and innovating on the internet ever since, with a particular interest in integrating on-line and off-line (in-person) networks. He runs a consulting business for businesses at the edges where Community, Sustainability and Technology intersect. He has recently started a PhD on KM and Informal learning for Sustainable Development at Southern Cross University.

Jim Nicholls is the principal of ACE North Coast and a partner in the ACE Training Network, and has 30 years experience with ACE in two states. He has had a long-term interest in education for social justice, innovation in ACE and adult learning theory.

The Byron Knowledge Management project is exploring some of the ways to enhance learning outside of the formal environments, both on-line and off-line. It is drawing on the background of community networking and Communities of Practices in business, to build communities inter-organisationally and cross-sectorially within different industry segments broadly chosen from the area of Sustainable Development.

## What's wrong with how we are working now?

There are fairly strong arguments that the training and higher education systems we have now are not meeting the needs of learners, especially at the higher levels – Cert IV and above.

*“Two underpinning insights have arisen from all research ... First Australians are passionate about learning, but for most of them learning is not synonymous with education and training and their passion is not linked to their experience - or even their expectations - of formal education and training” – (ANTA 2000 p4)<sup>iii</sup>*

The key problems in a changing world are that information gets out of date quickly, and skilled workers need to be able to learn a significant amount of new material on an ongoing basis. This does not match well with a traditional training environment since it is frequently hard for learners to match those needs to courses, and even where the right courses exist, it is frequently hard to predict what needs to be learned sufficiently in advance to match those needs with course schedules.

*“The uncertainty of the environment means that respondents do not know what knowledge and skills they might need - until they are needed. What respondents did speak of was the importance of the timing of skill acquisition - needing those skills just in time when they recognised a deficiency.” – (Owen & Bound.- NCVER 2001 p40)<sup>iv</sup>*

Delivering coursework online may solve the timing and availability problems, but usually reduces the interaction with the teacher and other students, reducing the possibilities for adapting the teaching to the student's requirements, and for further learning and grounding of the learning through interaction with other students.

The working environment is changing, and traditional, full-time, long-term employment is rapidly becoming the exception. More people are contractors – it is estimated that 49% of the workforce were in non-regular employment in 1993, up from 37% in 1973, many people work

as contractors, or multiple part-time jobs. Frequently VET does not reach these people especially for higher-level skills. And in particular training that is linked to employers' requirements is unlikely to meet the needs of the Learner whose needs are tied to generalisable skills that can be taken to the next client or employer.

Recognised, accredited, certificates assist in ensuring that training is transferable, but also have weaknesses where skills change, since the accreditation and standardisation process tends to lead to an inability to adapt to the changing environments, and situational requirements.

There is also research that suggests that standardised, replicable, competency based training cannot meet the requirements of a changed, and changing work environment.

*“There is limited evidence that CBT itself is directly associated with the development of a skilful and adaptable workplace. ...the key antagonism between CBT and the development of adaptability and flexibility is vested in CBT’s focus on outcomes, rather than process. ...The orientation employed for developing the educational intents denied the very thinking and acting which determined performance. The national focus and the means of implementation also misrepresented the complexity of vocational knowledge, its situatedness, the teaching and assessment of that knowledge, and the basis by which teachers commit themselves to their practice.” (Billet 1998 pp3-4) <sup>vi</sup>*

This paper, and the Byron Knowledge Management Project, is about looking outside the box, to consider how colleges can assist students by using Knowledge Management principles and in particular Communities of Practice (CoPs) to meet their learning needs.

## What is KM and what are CoPs and how does it fit into this

Knowledge Management is a cross-disciplinary approach, so what it looks like depends on where you are standing. IT professionals often use it to mean any software that manages content. Business development people think it's about the control of knowledge flow, while consultants typically use it to refer to process improvement. Human Resources practitioners are mostly concerned about retaining expertise during staffing changes, while hopefully Adult Learning professionals are considering it from the perspective of informal learning.

## A brief history of Knowledge Management

Knowledge Management has had three main threads running through it. Obviously history depends on the standpoint of the observer, so there are other ways of perceiving this history.

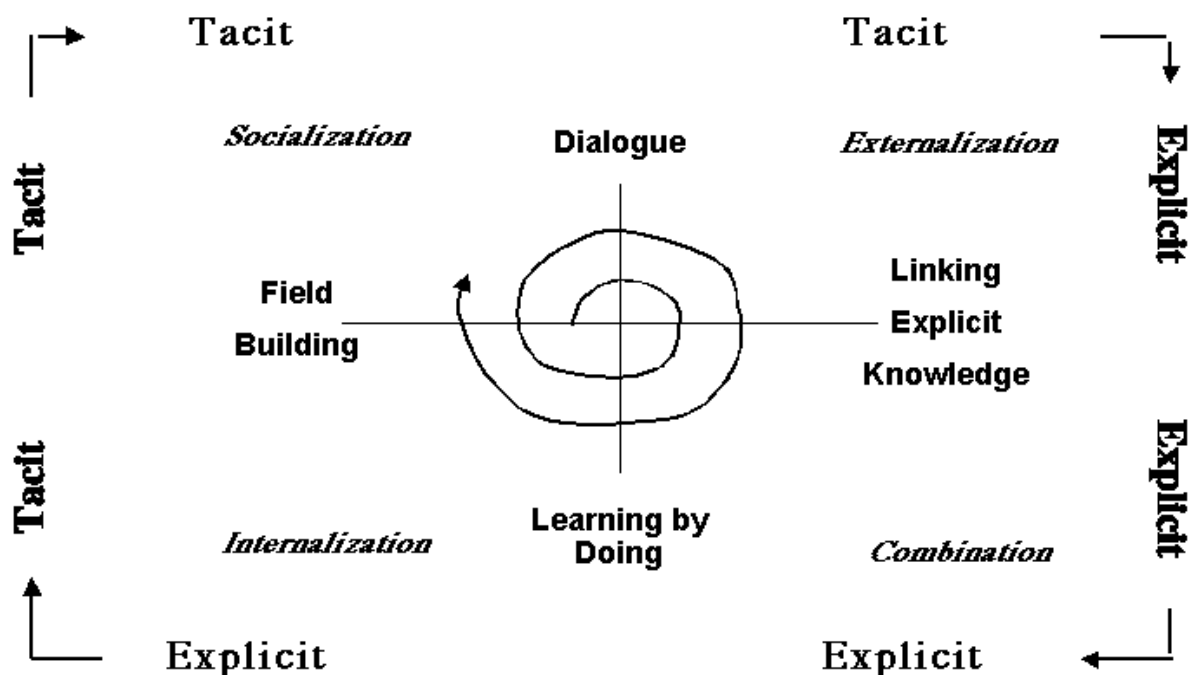
The first thread, and historically this was the dominant stream especially among Knowledge Managers who came out of an IT background, was based on a realisation that most of the really interesting information on an organization's computers was not accessible to anyone in the organization other than the author and possibly the people they sent it to. This thread was known as “Data Mining”, and the basic goal was to find ways to collect that information from wherever it was stored, store it in a large company-wide database, organise, index, codify and add meaning to the data so that information could be found. Because of the magnitude of the problem much of the work was in methods for automating this process.

Data Mining has its limitations because much of the knowledge that is important to an organization is in people's heads, rather than in its documents and files. These two kinds of knowledge were called Explicit (written down) or Tacit (in people's heads).

The second thread, often known as “Information Management” came about as the limitations of Data Mining became apparent, and the focus of KM became the “externalisation”, i.e. taking Tacit knowledge from people’s heads and codifying, structuring and organising it to make it accessible to other people.

These processes are often seen through Nonaka’s Spiral of Knowledge.<sup>vi</sup> Where he described how knowledge flowed through four processes: Socialisation, Externalisation, Combination and Internalisation. Nonaka views the movement of knowledge through all four processes as essential.

## Knowledge Spiral



In Nonaka and Takeuchi, *The Knowledge-Creating Company* 1995, page 71

(As an example of how poorly the publishing process has kept up with the needs of 21<sup>st</sup> Century KM, while Nonaka is much quoted on the Internet, we have been unable to locate any of Nonaka’s writing online)

The use of the words Tacit and Explicit cause a great deal of controversy; essentially the distinction is between whether Tacit means, “Not yet externalised” or “Not externalisable

Kimble and Hildreth argue: “What is fundamental however is that the KM field needs to recognise that knowledge is in people – be it soft or hard. The only difference is that the harder aspects of knowledge can be externalised and the softer aspects are much harder to externalise (indeed some can never be articulated). The precise boundaries between the softer and harder aspects are fluid and subject to change. The softer and harder aspects co-exist, however, when knowledge is articulated there is always a part that cannot be externalised. The failure to

*recognise this has led to some of the earlier problems with KM. In effect it need to be recognised that all KM projects must address both the hard and soft aspects of knowledge.”<sup>viii</sup>*

This leads to two different approaches, IT professionals tend to look for processes to capture and codify more and more of the Tacit knowledge.

The other approach is to accept this difficulty and to focus on ways to better share Tacit knowledge person-to-person, which leads us to the third thread through Knowledge Management. That of Communities of Practice – the core of our own work.

“Communities of Practice” is a term coined by Etienne Wenger <sup>ix</sup> to cover processes that have been around for a long time in the community networking movement<sup>x</sup>, and the Green and Women’s movements <sup>xi</sup>, and within education through groups like AOLIN <sup>xii</sup>. Communities of Practice are essentially about bringing together people to share knowledge and experiences. The core insight is in bringing people together, people who share a community in what they practice and who by sharing their knowledge can increase the learning of all the participants. From an IT perspective the key challenge is to provide access to the right people, not to the right information.

## Communities of Practice

Communities of Practice (CoPs) typically exhibit most of the following characteristics.

- The participants have a shared purpose, passion or interest.
- There is a common cultural context, allowing the participants to relate to each other’s problems.
- There is a common location, preferably physical, but can be virtual, where the participants can gather and share information in an informal manner.
- There is a human-scale, for example CoPs usually work well between 10 and 150 participants. There need to be enough participants for a useful interaction, and few enough to allow for participants to relate to most of the other participants.
- Cut across typical organisational boundaries, for example bringing together people working on a particular product from the Engineering, Marketing, and Sales departments, or in a company organized along product lines then bringing together all the customer service managers.
- Support and value different levels of expertise
- Encourage free sharing of information, and recognize people both for their expertise, and for helping others.

## How do Communities of Practice and KM relate to Adult Learning

First of all, let me state that the topic of our project is not about how to use Knowledge Management to better manage the delivery of services. On its own, that is a big enough topic for an entire organization. The US based Institute for the Study of Knowledge Management in Education ([www.iskme.org](http://www.iskme.org)) is one place to look for this.

One way of looking at the progress of learning through history is to consider how learning started off, before writing was widespread, in village environments where all learning happened through personal interaction, either by physically demonstrating (what we would now call mentoring), or verbally and in particular through story telling.

As writing developed, more and more knowledge was written down, and learning moved to more formal settings – classrooms, universities etc. This led to a pair of assumptions that unless knowledge could be written down (externalised) and could be taught in a formal environment, then it had little value. To become an expert in most disciplines required reading all the literature available, and/or taking the courses on offer, and in more recent years it has meant accessing the same literature and courses via computers and the Internet.

As knowledge has expanded, learning requirements have expanded, and the timelines have contracted to “internet-time”. We are moving once again to a situation where to stay on top of a discipline requires maintaining ongoing contacts with other practitioners, either locally and in-person, or over the internet.

The Adult Learning sector needs to ask itself how it can stay on top of these changes. This is important for two reasons.

1. From the sector’s perspective. There is a significant possibility of the Adult Learning sector being side-lined if it cannot meet the needs of learners, i.e. for up to date learning, when it is needed, and the support to stay current, while both the topic, and the learner’s needs change.
2. From government’s perspective. If the training sector is not involved in the bulk of the learning then there are limited possibilities for enhancing that learning, and ensuring that Australia becomes a leader in the “knowledge economy”.

There are a number of possibilities for incorporating Knowledge Management and Communities of Practice into the Adult Learning and Community College environment, but they require a broader vision of what learning is.

The techniques used to build CoPs are not new, Community networking online has been occurring since about 1985, and CoPs have evolved out of concepts within organizations, and networking between organizations. What is relatively new is applying this from a learning perspective, across organisational and sectoral boundaries.

One obvious function for CoPs is to provide ongoing learning opportunities that do not start and end with the course. By providing ongoing communications mechanisms, students of any particular course can continue to interact with each other. Potentially this also acts as a place where students and teachers can recommend resources to each other. The students in any particular course have already built up a community, so the effort to get an on-line community going is significantly less.

At the recent NSW ACE conference in Sydney (August 2003) an unscientific survey showed that while almost all of the staff present gave out handouts, and most of these handouts contained web sites, only three of those present had pointers to web sites that they maintained, and none of them were using any method of ongoing communication - for the students, beyond the end of the course, for example an email list, or an interactive web site. This same group – of Adult Learning professionals - indicated that none of them used courses as their primary source of learning.

An online, or in-person network built from the participants in a course, would be one simple example of a Community of Practice, i.e. we are recognising that the students come to the

teaching with a certain level of knowledge, and hopefully leave with more, but if we assume that they are really interested in the topic, rather than just trying to acquire a certificate – we can assume that they keep learning. And that the resources and insights of one student are more than likely to be of interest to the other students who went through the same course. For example the participants in a recent Cert IV Training for Small Groups expressed a lot of interest in remaining in touch by email, to share their challenges as they all moved out into real – rather than classroom – training environments.

If this is considered slightly more broadly, then linking students from a course, with those who did the course last year allows for lessons learned in practice to be communicated to less experienced students. Neither of these two models changes the overall picture that much, however both require some effort from service providers, and therefore needed to be figured into the funding for courses.

If Adult Learning is going to adapt to change, it needs to consider being involved in the aspects of learning that happen outside the classroom. If government wishes to influence and enhance learning, and create the much talked about “Knowledge Economy”, it will also have to consider how to support informal learning, as only funding courses, will mean influencing less than half of the learning that is actually happening.

There is an opportunity for training organizations to consider the creation of learning communities, and this is the major area that we are exploring in the Byron Knowledge Management Project.

## What are we doing - case studies

The Byron Knowledge Management Project was started in April 2003, as a BVET funded pilot project of ACE Training Network, to explore applying Knowledge Management and Communities of Practice to Sustainable Regional Economic Development.

We held two workshops, the first facilitated by Tim Kannegeiter until recently of Standards Australia, to introduce the concepts to the community, and the second exploring the issues of moving to a knowledge economy. About 30 people attended each workshop. Participants brainstormed at the meeting, and a follow-up online vote chose six of these.

For each of the chosen areas, we will discuss what we’ve done, and what we learned, and then sum up with some general lessons. We’ll present the problems we’ve encountered because there is much more room to learn from the difficulties and mistakes than the successes.

There is deliberately a high degree of diversity in the cases chosen, the intent is to gain as much knowledge as possible of what works and what doesn’t in different circumstances.

## Byron Innovators Network

BIN is a collaboration with other parts of CLIC – the Community Learning and Innovation Center – where the KM project has its office. The idea is to bring together innovators within the region, to share information and support each other. This is particularly relevant in the region surrounding Byron because there is a relatively high amount of innovation, and a large number of over-skilled, under-employed experts who have made the “Sea Change”, leaving high paid jobs in the capital cities. A full afternoon’s launch meeting was organised at which the ABC’s Robin Williams and several local speakers presented. There were around 35 exhibitors, each with a table, or some wall space, and around 150 attendees.

## Four areas of future work are under way.

- A mentoring program, matching business experts with innovators. Businesses and Mentors were invited to express interest. About 10 mentors with significant business experience, have put together a process which filtered the businesses down to a pilot of four. The process consists of a fairly length self-assessment, followed by two workshops per business with a panel of mentors. Documenting this process in itself could be a worthwhile outcome of the KM project.
- Follow up networking meetings, either with local speakers or lesser known visitors and lots of time for informal sharing – the first is scheduled for late October.
- Larger showcase events intended to increase exposure to the public for the exhibitors, to be planned roughly annually.
- Online networking – involving news of participants, government information such as sources of funding etc.

## Issues

- A short time table for the event, meant that the follow on work was not ready to present at the launch
- Personal issues and other responsibilities have made it hard to bring the core-group back together to create follow on.
- The online component is much less interesting at a face-to-face meeting, so few people saw the web site during the launch. This was also a problem faced by all of the innovators whose display was largely online or a video.

## Professional Artists Network

P.A.N. is an incorporated association of visual artists. P.A.N. has grown out of the shared desire of Byron shire visual artists to assist each other in their diverse practice. In contrast to BIN, PAN has been in existence for several years, with a membership of around 100. They meet monthly for business meetings, and monthly for speaker meetings. The chair of PAN saw immediate potential for a Knowledge Management approach – she was an early enthusiast for the project. The project was presented in one of their meetings, and to a sub-committee created for this purpose. A series of requirements were developed, based on a mix of what was already available on the APC-AA platform (news, moderated mailing lists, calendar), and what was needed and could be developed (document management and virtual gallery for each artist or show). The website is now built and we are meeting with P.A.N. to start the online processes, which will define future work. There was also a need to migrate their existing minimal web site to integrate it with the KM site.

## Issues

- PAN is a community of artists. Administration and Organisation are therefore not the strongest aspects of the group.



- There is a perception that most of the PAN members do not have email. This brings up access issues, while these need addressing our general perception is that these are made more important than necessary since there are many ways of accessing the web, and typically over the last few years the percentage of people with no access to the net has dropped significantly. The organization has 40 of the members addresses, but several other members commented that they had email but weren't on the list.
- The development, and integration of the technology is an ongoing process, each CoP can reuse a number of modules defined for previous CoPs with only minor changes, however there will almost always be some new requirements that either are not available and require developing, or at least require a learning curve in discovering how to set them up correctly. As is typical for a project of this kind, 10% of the requirements required 90% of the effort.
- Meeting the final 10% may seem to be a low priority, and may even be outside the immediate learning objectives, however if this final 10% is what is needed to ensure that the CoP become regular users of the system then they need to be considered seriously.
- An issue arose in distinguishing between a web-site for publicising the group, and a communications medium, and expectations had to be addressed.

## Sustainable Agriculture

SART is a round-table initiated by Byron Shire Council, to develop a policy on Sustainable Agriculture. It has been meeting for several months. The SART facilitator is on the KM project reference group, providing natural synergy – SART had also identified Knowledge Management as an important area for future work. The project was presented at several meetings of the group, and its subcommittee.

At this point (October 2003) a Knowledge Manager with experience in generating reports etc within the Sustainable Agriculture industry has been appointed and is getting familiar with the requirements.

## Issues

- While the group has a charter encompassing other aspects of Sustainable Agriculture, the focus of the group is on developing a policy for Byron Shire Council, so it's hard to get focus on Knowledge Management.
- The groups agenda setting process, and other priorities accumulated to a six month delay, which is a substantial chunk out of a ten-month timeline.
- The knowledge sub-committee's chair doesn't have email, and has an antipathy to technology, which required sensitive working around!

## Youth Enterprise

The Youth Enterprise sector does not have a single organization, but there are a number of local initiatives. We met with one project's facilitator, but it was determined that there wasn't really an angle for Knowledge Management. We then met with another facilitator who was very receptive to the ideas, and keen to move forward. We participated in a large four-hour meeting of Youth services (70 attendees), some ideas on how information sharing could have improved the meeting were presented.

## Issues

However constructively suggestions for change are made, they can be perceived as negative criticism by the organisers. This was the result in this case, and the project is on hold.

## Event Organising

There is no organization in this sector. We met with several organisers and two issues came up consistently – Insurance, and Dealing with Council. We set up a workshop on insurance and widened the audience to include community groups, venues etc. Several key people were contacted and networked the event out to the 25 attendees. An insurance broker active in community events was a valuable resource – and showed the need to make sure specific expertise was present. The high degree of participation by most of the 25 participants obviated the need for several presentations which had been prepared.

A follow up meeting, six weeks later continued the process and discussed the second issue (council), with a smaller number of people.

An event organiser was contracted as the Knowledge Manager to write up her own experience as a guide and to survey other organisers on important issues.

Using Knowledge Manager's for all the CoPs was an original intention of the project, however the budget has not been sufficient to contract for a useful amount of someone's time in most cases. We are interested to see how this Knowledge Manager performs within the project as another model of practice.

## Issues

- It is important to get the informal networking going early in the project, Participants initially arrived and sat mostly silently waiting for the organisers (the authors) to start presenting. We invited people to get cups of tea, and this broke the ice, with conversations and interaction starting among the participants.
- We had to balance the useful information that the insurance broker made available against the possibility of it being perceived as a sales pitch. The brokers volunteer activities established credibility, as did his willingness to share information that did not necessarily benefit his business. This showed clearly the way that potential conflicts of interest are not necessarily a barrier to effective knowledge sharing.
- It was important to balance the need to cover certain issues on the agenda, with the relative importance of those issues as determined by the participants. It was particularly important to know when to allow a conversation to continue, and when to bring it to a close.
- At the end of the meeting, we planned the next one, one of the participants suggested less frequent, but longer, meetings, and it was important to be flexible and check this with the other participants who expressed a similar preference.
- There has so far been a poor number of returns to surveys, and this is a current issue being addressed, both through wider publicity and through direct follow up with key potential respondents.

## Appropriate Tourism

This is our final area to tackle, and is still in the planning stage.

We are trying to do 2 or 3 books which integrate aspects of currently diverse knowledge held in the region. These will be personal profiles so that people can talk about what this aspect of knowledge means to them.

The first example which we are working on is Spiritual Teachers. Another on the list is "Earth Workers".

The region is rich with people who are working on saving/understanding/nurturing the environment from a wide range of perspectives and yet there is no integrated source on their ideas/approaches/philosophies. It is the same with Spiritual Teachers.

Hopefully through the books and website there will be constant updating so that there is an implicit dialogue between the participants and similarities and differences can be noted by way of editorial overview.

The whole process would amount to the region (bio-region?) managing the environmental knowledge which is contained and promoted (currently fairly randomly) within it.

This will be yet another approach to Knowledge Management as it evolves.

## Overall Lessons for us and the broader Adult Learning Community

- It is hard to get a Community of Practice started without some existing network or organization to base it around, since it is necessary to first convince the group of people to work together, and secondly that Knowledge Management and Communities of Practice are the appropriate tools for collaboration.
- It can be hard to get an existing organization to see KM and CoPs as important, for example to place them on an agenda with enough time for serious discussion.
- Balance flexibility and achieving goals when running meetings.
- Working with other groups risks losing control of the timelines and outcomes.
- Busy people aren't interested in KM, they are interested in the results that KM can bring, so focus meetings on the outcomes, not the process.
- Balance an honest critique of the existing situation with sensitivity for organiser's egos. Be prepared to get this wrong!
- There needs to be a change in attitude from teacher, to facilitator. This may not be easy for people used to being the expert who knows the answer to everything.
- Any approach to funding which only measures and values student contact hours is going to find it hard to fund this, or any other, innovative approach to enhancing learning.

## Summary

Our work in Knowledge Management related to the ACE sector has led to some re-thinking of the ACE paradigm. In recent years the agenda has been captured to a large extent by vocational training. This has led to many improvements in re-thinking course directions and quality issues but it has meant that the ACE mission has been more and more about courses. Other historic ACE missions such as Basic Education, Education for Social Justice and Community Development have been overshadowed in the process.

Knowledge Management gives us a new opportunity to think again.

We hope that our project is demonstrating the relevance of Knowledge Management in a community setting. We believe that this can be generalised to other communities. It could be seen as growth of a process from organisations, public and corporate, into more generalised community work.

We would not see the task ending there. Knowledge Management is equally applicable to individuals who must keep up with changes in their work or leisure environment. Individuals more and more use the Internet as an adjunct to courses but also an alternative to courses – the very availability of knowledge through search engines and email lists makes this increasingly possible. Mitra's work with RSS shows how this might expand in the next evolution of the Internet to include customised updates of an individual's interest profile. All this intersects with Flexible Learning initiatives over the past few years.

We could characterise a lot of current learning theory as aiming to turn individuals into managers of their own knowledge.

Similarly KM in organisations and communities generalises to larger levels of complexity such as bioregions and economic regions. A Basque model<sup>iii</sup> revolved around an economic region. Bioregional tasks such as Catchment Management Committees, even to the level of the Murray Darling Basin Commission are really Knowledge Management projects in their essence.

We have been encouraged to note that NSW BVET is taking this perspective with regard to the state's Knowledge Economy and even ANTA's work with Training Packages is a way of managing knowledge at a national level.

## For further information see:

[www.byronkm.com](http://www.byronkm.com) or email the authors.

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<sup>iii</sup> Anta 2000, National marketing strategy for skills and lifelong learning, ANTA Ministerial Council, Brisbane. (as quoted in Owen & Bound, since we are unable to locate the original on [www.anta.gov.au](http://www.anta.gov.au))

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<sup>iv</sup> Owen C & Bound H (2001) "Contractor alliances and the new world of work" NCVER, available online at <http://www.ncver.edu.au/research/proj/nr9032.pdf>

<sup>v</sup> ILO and OECD data cited in Burton-Jones 1999 as cited by Owen & Bound 2001 p14

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<sup>vii</sup> Nonaka, I. (1991) "The knowledge creating company." *Harvard Business Review*, **69** , (Nov-Dec), 96-104

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<sup>x</sup> Monash University center for Community Networking Research, [www.ccnr.net](http://www.ccnr.net)

<sup>xi</sup> Association for Progressive Communications, [www.apc.org](http://www.apc.org)

<sup>xii</sup> Castro, Angelo - Introducing AOLIN: Australian Open Learning Information Network, online at [http://cade.athabascau.ca/vol2.2/11\\_fyi\\_castro.html](http://cade.athabascau.ca/vol2.2/11_fyi_castro.html)

<sup>xiii</sup> Angel Luis Arbonies & Monica Moso: "Basque Country: the knowledge cluster", In *Journal of Knowledge Management* Vol 6 No 4 2002, pp 347-355