Getting the most out of our online teaching resources

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‘Each learner has different needs, and the challenge for VET is to deliver products and services that motivate learners, that address their specific needs, and help them achieve their learning goals – and through that their career and life aspirations’. (ANTA Annual report 2002)

Abstract
Australia’s achievements in developing quality online resources for vocational education and training are exemplary. A number of well coordinated national initiatives have paved the way in developing an infrastructure for the creation and deployment of online content for learning and training. The Australian Flexible Framework initiative, which has adopted a holistic approach to content development, has had a significant impact on transforming flexible learning through professional development, community building, mentoring, and building its capacity to share teaching and learning resources across state boundaries. But many challengers remain. How do we ensure that mechanisms are in place to facilitate unrestricted access to resources by all learners, anytime from anywhere?

Introduction
Australia, the USA, and a number of European countries have been some of the first nations to harness the benefits of information and communication technologies (ICT) and lay the foundations for the development of quality repositories of resources. Early government initiatives like EdNA Online set the scene for national collaboration in Australia where all governments (national, state and territory) came together to shape the nature of online products and services for education and training. The emergence of gateways, portals and clearinghouses provided students, teachers, trainers, policy makers, researchers, IT workers and the community at large with free access to resources and tools to foster and facilitate collaboration and information sharing to enrich learning experiences.

This paper examines repositories, and specifically VET related repositories, from many perspectives, including a number of human factors. Repositories are not just about storing resources, which by themselves are not very valuable. Learners also need tools to deliver, adapt and deploy resources and skills in how to use these resources. Therefore, a holistic approach is desirable in developing a framework for undertaking such an activity.

Historically, various Australian Government authorities have been established to support education and training. Key to this discussion is the Australian National Training Authority (ANTA), an Australian Government statutory
authority providing a national and industry-led focus for Vocational Education and Training (VET). ANTA was established in 1992 and paved the way for major reforms, endorsed by the Commonwealth, states and territories, which significantly included a national vocational education and training system. A national collaborative system enables the sector to better harness the benefits of the Internet for the education and training community. The proceeding discussion will focus, largely, on a national initiative administered by ANTA, which embraces the information and communication technologies to enhance the education and training sector we work in.

This initiative, the Australian Flexible Learning Framework (Framework), by any standard, is a world-class project designed to create and share knowledge about flexible e-learning approaches to training delivery with an emphasis on adoption within the VET sector. A holistic approach has been adopted in constructing an infrastructure, which aims to build knowledge and skills to enable people to operate effectively as workers and citizens.

Projects funded by this initiative have supported development of quality online content and services and professional development opportunities. They have also facilitated and fostered the development of an interoperable system for the management and exchange of resources, and community support and leadership.

**Conditions for change**

Coinciding with the advent of the Web, state/territory and national planning bodies began to put in place strategies for collaboration that would result in a world class vocational education and training system. In 1992 ANTA was established to oversee the administration of national programs and the Australian Government funding of the national VET system.

These and subsequent reforms saw industry skill requirements expressed as competency standards, grouped to form nationally recognised qualifications in training packages. We saw the registration of training organisations to deliver training and assessment for these qualifications, according to standards set out in a quality framework. These reforms laid the foundations for future collaboration and the framework for a truly national system where the use of information and communication technologies could deliver economies of scale.

A number of key national reports have provided the strategies and policies towards the establishment of a national information infrastructure, which facilitates a rich e-learning environment. These policies focus on harnessing the powers of information and communication technologies to deliver unparalleled benefits for teaching and learning. (White, 2003)

In 2000, the Australian Government published its blueprint, *Learning in a Knowledge Society: an Education and Training Action Plan for the Information Economy* and associated action plans were developed by the schools, vocational education and training and higher education sectors. These
action plans were developed collaboratively by all Australian government departments and agencies, including ANTA and the Australian Vice-Chancellors' Committee (AV-CC). The action plans used an agreed framework of five key areas:

- **People** - providing the skills to drive the information economy (including improved career advice for students and professional development for teachers, trainers, content developers, researchers and all workers in education and training).
- **Infrastructure** - reliable and sustainable telecommunications and information technology infrastructure including high bandwidth.
- **Online content, applications and services** - new approaches to education and training content, applications and services and a quality assurance framework including the development of standards for technical interoperability and intellectual property rights management.
- **Policy and organisational framework** - promoting a shared national vision for education and training to support and sustain the information economy and knowledge society, including the maintenance of collaborative organisational structures.
- **Regulatory Framework** - a regulatory framework in areas such as telecommunications and copyright to support the needs of education and training without inhibiting progress and change. (DEST, 2000a)

Since 2000, policies and initiatives have been pursued that promote collaboration to address ICT issues; support the professional development of teachers and trainers in ICT skills and in the application of ICT training environment; and ensure a coherent national approach to interoperability and common standards. The initiative that embodies the above strategies for the VET sector is the Australian Flexible Learning Framework.

**The Australian Flexible Learning Framework**

The Framework is a five-year national strategy running from 2000-2004, which aims to accelerate the take-up of flexible or e-learning approaches to training and utilise new technology in the delivery of training. A core goal of the Framework is developing creative and capable people through:

- using a range of professional development models to help build a critical mass of staff at national, state, territory and provider level who are skilled in the pedagogical, technical and managerial aspects of flexible learning;
- encouraging the national system and VET institutions to continuously improve the capabilities of their staff to provide flexible learning services and to use technologies to achieve business objectives; and
- developing international virtual communities of interest amongst VET staff in the field of flexible learning in VET. (Framework, 2004a)

Each year funding of $20 million has been allocated to projects ranging from the development of online content to developing online communities of
practice, and professional development. These projects are managed by the Flexible Learning Advisory Group (FLAG) whose membership includes an ANTA CEO and Department of Education, Science and Training (DEST) nominee.

Broadly speaking, the purpose of education and training is to build knowledge and skills to enable people to operate effectively as individuals, workers and citizens and for Australia to be internationally competitive in order to sustain economic prosperity. The VET system strives to ensure the skills of the Australian labour force are sufficient to support internationally competitive commerce and industry, and to provide individuals with opportunities to optimise their potential. VET performs a key role in providing Australians with the skills and knowledge needed to enter the workforce for the first time, to re-enter the workforce, to retrain for a new job, to upgrade their skills and to learn throughout their lives (ANTA, 2002). In short, VET is building the capacity of the Australian workforce to successfully operate in a globally competitive environment.

In the last four years the Framework has implemented projects that endeavour to skill Australians for the rapidly changing world. A number of projects have been funded to support the development of learning objects, Toolboxes and preferred standards. Underpinning these activities has been a comprehensive program of professional development and support for communities of practice and leadership in the implementation of flexible learning.

**Toolboxes**

Toolboxes are collections of online training materials comprising learning activities, resources and user guides to support program delivery for endorsed training package qualifications. They are designed to support the delivery of VET qualifications from Certificate I to Diploma level. Training providers can also customise Toolboxes to suit a wide range of training contexts and different learner needs. Over 100 qualifications and more than 820 competencies can be delivered using nationally endorsed training packages. Currently more than 75 toolboxes are available. To support Toolbox take-up, the Framework has funded a network of Toolbox Champions in each state and territory who are available to assist with the use and customisation of Toolboxes.

‘Toolbox Champions’ assist in the implementation of the Toolboxes by organising and conducting professional development activities, mentoring teams wishing to implement toolboxes, providing advice about usage and assisting in developing national Toolbox user groups to facilitate information exchange and ongoing support for new Toolbox users.

**Learning Objects**

The term ‘Learning Object’ describes a digital entity designed to support a particular learning experience that can be used either by itself or as part of a larger
aggregation. Modularity and reusability are key features. The creation of learning objects can be expensive. Online content needs to be created in a manner that facilitates its use and reuse in a variety of contexts. One of the Framework projects is repackaging Toolboxes as learning objects using international standards for description and sequencing. This enables the learning objects to be manipulated and used in Learning Management Systems and gives trainers more flexibility when selecting materials for their courses. Another benefit is that Australia is producing online content for the international market as these learning objects are created using international standards such as SCORM (Sharable Content Object Reference Model).

**Interoperability**

The aim of the Interoperability project was to extend access to resources for the VET sector by focusing on information management and adoption of appropriate technical standards. The work of this project has been documented and is available from the Interoperability Framework website (http://www.flexiblelearning.net.au/interop/). A significant outcome for 2004 has been the development of a VET metadata application profile based on the international IEEE Learning Object Metadata (LOM) standard, consisting of desirable and mandatory elements. The selection of mandatory elements was based on maximizing resource discovery and achieving compliance with SCORM content packaging requirements, which enable wider interoperability and facilitation of exchange of data.

**Professional development**

VET professionals are essential to the national system in meeting workforce and industry needs and facilitating linkages between employers, training providers and the broader community. The VET workforce faces many challenges, including how best to respond to changes in the workplace and in ways of conceiving skill, knowledge and learning. A number of projects have focused on skilling VET practitioners in flexible delivery, in the use of technology to assist learning, particularly for disadvantaged people and people with disabilities. In 2002, over 7000 staff in registered training organisations furthered their skills in key areas (ANTA annual report, 2003). Seminars and conferences like the renowned Net*Working Conferences provide opportunities for VET practitioners to renew their skills and knowledge and learn from each other in a congenial and flexible way. The LearnScope program continues to assist teachers, trainers, middle managers, student support staff, staff who support teachers and trainers working in public, private, enterprise and community sectors, to develop skills to apply educational technology in learning. Supporting this is The Australian Flexible Learning Community, a virtual environment for discussion and information sharing among VET professionals. Over the years a number of leading VET practitioners, in various roles, have become Flexible Learning Leaders. This initiative has provided managers and practitioners with development funding to expand their skills and knowledge of flexible learning pedagogy, learning technologies and leadership capabilities needed to support organisations to implement flexible learning approaches.
In summary, the projects above have laid the foundations for the development, management and deployment of VET online quality content. The design and creation of training content, based on international standards developed and effectively managed equips the VET sector with resources to provide flexible learning demanded by today’s rapidly changing societies and economies. The Framework, through the above mentioned initiatives has also developed skilled professionals with pedagogical and technical skills to manipulate content and deliver customised and individualised programs as required by the client.

**Key VET agencies and services**

Along with state and territory based products and services a number of initiatives have been implemented to equip the sector with resources to deliver flexible, world-class VET courses across Australia. These provide the VET sector (providers and users) with information about the national system, courses, training organisations, learning resources and publications.

*education.au*

*education.au* is the Australian national ICT agency in education and training servicing the schools, VET and higher education sectors. *education.au* has established a national infrastructure for VET digital resources and a comprehensive global selection of quality digital resources specifically for the VET sector.

The national online education and training service, EdNA Online ([www.edna.edu.au](http://www.edna.edu.au)), together with myfuture ([www.myfuture.edu.au](http://www.myfuture.edu.au)) which is a national careers information service, provide a comprehensive range of high quality and globally selected content, applications, tools and services. These are available freely and are targeted to VET teachers and practitioners.

**ATP**

Australian Training Products (ATP) is the main body for distributing the Toolboxes. ATP supplies RTOs in Australia as well as international customers. Along with its repository functions ATP also undertakes marketing, runs workshops, reproduces the Toolboxes in CD format, is the custodian of the master copies and administers the sale of Toolboxes.

**NTIS**

The National Training Information Service (NTIS) has been developed by ANTA to provide access to current and emerging training market information and products in vocational education and training. Currently, the NTIS comprises a database of VET accredited courses, competency standards, Training Packages and training providers and text information on a range of complementary issues. A complete rebuild of the NTIS commenced in August 2002 in response to increased user expectations, new technologies and business requirements. The rebuild, based on consultations with a range of stakeholders, including state and territory training authorities will ensure the
NTIS meets user expectations. The rebuild includes:

- improved search facilities;
- improved access to detailed Training Package information, and the capacity to publish Training;
- packages and their components via the web;
- archival capacity and recording of Registered Training Organisations scope, accredited courses and Training Packages, and;
- capacity to download customised reports and electronic files and version control for files.

**training.com.au**

The VET portal (training.com.au) is a business response that aims to provide a single point of entry for accurate, current and consistent information about the VET sector and to provide a future e-commerce platform for clients to transact their VET business. The VET portal provides a single entry access to information about the training system, courses and qualifications, information about training organisations, apprenticeship information, VET related publications, networking information and VET news.

**Resource Generator**

The Resource Generator ([www.resourcegenerator.gov.au](http://www.resourcegenerator.gov.au)) is an online tool used to develop training plans that assists trainers, assessors and teachers with the implementation of Training Packages. In 2001, the site was initially populated with resources for six industries, and during 2002 increased to 17 industries. Usage of the site has risen throughout 2002 with a 112.8% increase in activity. (ANTA, 2002)

Training Package support materials available through the Resource Generator in key priority areas include: licensing (e.g., electrical licensing), assessment (e.g., assessment tools for the Health Training Package), regulation (e.g. Coal Mining Industry), and strategic industry intervention (e.g., Financial Planning). Training Package implementation guides provide consistent national, state and territory information for RTOs about how to implement particular Training Packages.

**AEShareNet**

AEShareNet provides a catalogue of resources available for use in training programs along with details of licensing conditions and information about how to access the resources. These resources, in print or electronic format, include units of competence, workbooks, learning objects and a wide range of other learning materials. Currently, AEShareNet’s database contains in access of 21 000 resources.

AEShareNet’s core business is licensing of materials and brokering licensing agreements. Its database contains a consolidated list of materials owned by many different training organisations across the VET sector. AEShareNet aims
to integrate the licensing and supply functions so that users are able to
discover, preview and purchase resources in a seamless manner. Another key
role of AEShareNet is its ability to assist in marketing VET learning resources
to potential customers within and outside the sector.

The above services provide the sector with a wealth of resources, from
information about the sector and registered providers to learning resources,
news and research. Search interfaces and navigational aids enable users to
access targeted resources.

Enhancing access to agencies and services

Through user-friendly interactive interfaces, agencies aim to facilitate
effective access and discovery to their products and services. These well
designed and standards based database driven services enable multiple and
customised views to learning and training resources intending to value-add
and enrich the learners’ experience.

Discover

How do we achieve effective and efficient resource discovery across the
multiplicity of repositories managed by the various VET projects and
organisations? How do we know that we have retrieved all the gems available?
Are full text search engines effective tools, tools we can rely on to return the
results we expect? How do we manage resources to enable discoverability?
All pertinent questions for repository managers when millions of dollars are
spent on creating quality learning content appropriate consideration should be
given to the description, classification and management of resources. Metadata
developed by collaborative communities and standards organisations is the
vehicle to deliver consistency in the description of resources and technical
interoperability across projects and repositories, not only on a national scale
but also globally. The above mentioned repositories use metadata to describe
and manage their resources. The use of meta-tags enables the description of
resources in terms of keywords, author, title, publisher, format, classification
in terms of discipline and other relevant information that may be deemed
appropriate.

Applying metadata in a consistent manner across the multiplicity of
repositories not only enables the sharing and exchange of resources but also
enables the interrogation of repositories from a single entry point. Federated
search, the ability to search selected repositories simultaneously and return
targeted results is not only efficient but exposes the user to a greater pool of
resources from which select.

An example of a successful deployment of federated search is the Distributed
Search Manager (DSM) on EdNA Online. Based on open source technology
and developed by education.au, federated search has enhanced the user’s
interaction with digital repositories. EdNA Online’s application of federated
search has enabled the interrogation of quality metadata repositories.
Currently, from a single interface one is able to access resources in the following repositories: ABC Online, Culture and recreation Portal, GEM (Gateway to Educational Materials), MERLOT (Multimedia Educational Resource for Learning and Online Teaching), Picture Australia and VOCED (Vocational Education and Training database of technical and vocational education and training research in Australia).

In the VET sector, a number of learning object repositories are in the testing phase of implementing federated search. Application of this tool across the VET sector will facilitate the interrogation of numerous repositories, from a single entry point search, and return to the user an integrated search result.

Other applications such as search strings and use of API (application program interface) will deliver customization of content based on search criteria. Local systems may utilise the richness of sector repositories to conduct specialised searches based on teaching resource need and present such results as support resources for particular programs or modules.

Access

What measures are in place to facilitate access to sector resources? How well are the local systems designed to deliver learning resources to their communities/clients. As mentioned above a number of quality repositories already exist at national and state levels with state systems at different stages in providing an integrated solution to resource discovery. At the national level, in terms of training packages and various types of learning resources, AEShareNet and ATP are the aggregators of these resources. They provide discovery functions, licensing and distribution. State organisations and clients can access and purchase resources and make them available from their local systems. Free information can be accessed anytime from anywhere.

Access to repositories of learning resources is currently restricted in depending on who wishes to use the resources and from where. Learners can only gain access to non-free resources from within training institutions or domains once these resources have been embedded in training delivery environments. Authorised users, such as teachers and trainers, have access but are still limited by the arrangements entered into by these organisations. In many cases access is only available via designated domains or servers.

Case study

The TAFE Virtual Campus (TAFEVC) is Victoria Government’s online service to fully accredited TAFE programs through online enrolment via a Registered Training Organisation (RTO). State funded online resources, toolboxes and other learning resources, are available through a secure site to RTOs. Through the TAFEVC users have access to:

• a knowledge portal containing information and links related to e-learning and the VET sector;
• a Learning management System (WebCT) for education providers to deliver courses. Toolbox materials are converted and uploaded to WebCT, and;
• a courseware catalogue containing e-learning resources for education providers to copy to their system and modify to suit particular learning experience.

Support for design and implementation of learning resources such as Toolboxes is provided through the Framework’s Toolbox Champions, TAFE Frontiers and through professional development activities of individual institutes.

Currently one hundred and sixty five RTOs are using the services provided by TAFEVC. These include access to Toolbox content and other learning resources which can be downloaded to local systems, enhanced and modified for particular purposes. The customised content is currently not available to be shared by other TAFEVC users.

The TAFEVC is one of the participating repositories in the Learning Objects Repositories project, which aims to create, manage and make learning objects accessible nationally. Discovery tools are being developed and tested to facilitate seamless access to all repositories. Also, by including information about print resources, in the repository, the system will provide a more responsive and flexible service.

Trends

The vision for vocational education and training for 2004-2010 as stated in Shaping our Future. (ANTA, 2004) states:

VET works for Australian businesses - making businesses internationally competitive; VET works for people – giving Australians world-class skills and knowledge; VET works for communities – building inclusive and sustainable communities.

Underpinning this vision is a commitment, by the VET sector planning authorities, to continue to work collaboratively with industry, providers and other stakeholders to develop education and training to meet future needs. In planning and making commitments for the future the following statistics are important indicators of trends.

• The Australian governments currently spend about $3.8 billion a year on vocational education and training and businesses/industry around $3.6 billion. (ABS, 2003).
• Of the 9.2 million jobs done today, over half did not exist in 1965 and a projected 1.5 million jobs will appear in the next decade. (ANTA, 2004)
• One million Australians were enrolments in vocational education and training in 1992, up to 1.5 in 1997 and 1.7 million in 2002.
• The proportion of businesses providing training for their employees, between 1997 and 2002 increased by 20% up from 61% to 81%. The training arrangement used most commonly to deliver structured training was external workshops, lectures, etc. (76% of employers that provided structured training), followed by structured on-the-job training (55%).

• Of the 728,100 persons engaged in the direct provision of VET in 1997, 59% were employed in organisations that provided training primarily for employees of their current employer or business.

• In 1997, VET programs were provided by 101 TAFE and other government institutions in 1,000 training provider locations, 599 community centres, and by 1,410 other registered providers. Some 74% of VET clients were enrolled in TAFE or technical colleges and 16% were receiving training from Professional or industry associations. (ABS, 2003)

Along with the rapid growth in the VET sector, in terms of people undertaking further education and training, industry-supported training and commitment is also making an impact. Another significant trend is workplace training. Employers across the industries understand the benefits of a skilled workforce and are making a substantial commitment to ensure they have well prepared employees to meet businesses’ needs and optimise individuals’ potential.

The next stage of the Australian Flexible Learning Framework, 2005-2007 will build on the established collaborative approach to e-learning which has delivered significant benefits across the sector. These include economies of scale through national pooling of resources; faster systems development; high quality e-learning products and services; and a talented pool of VET professionals able to design, implement and manage quality e-learning. Strategies are now in place to ensure that at the completion of the next phase of the Framework:

• a national knowledge management system will be in place;
• a strong and sustainable partnership exists between providers, industry and communities which accelerate and broaden the take-up of e-learning in workplace;
• agreed interoperability standards are in place;
• there is a demanding client base that puts pressure on the VET system to be more responsive;
• a national pool of quality e-learning resources is accessible to all, and;
• there is cross-sectoral collaboration for sharing content, expertise and research. (Framework, 2004a)

New Technologies

New technologies have provided us with unprecedented opportunities to communicate with others, to share knowledge and skills, and access an incredible range of information and learning resources. As technologies
change so will our interface with information and information services. Appropriate application of new and emerging technologies will increasingly provide us with an integrated and efficient education and training system. The implementation of single sign-on, wide application of federated search services, convergence of technologies, m-learning, peer-to-peer applications and realization of the potential of learning objects presents us with the tools to build the next phase of the national framework for education and training. The tools will provide employers, employees, the community and individual learners with opportunities to acquire education and training at any time from anywhere.

Conclusion

Over the last decade, Australia can claim significant achievements for education and training through the Framework and other government directed initiatives. The Framework initiative has led to the creation of Toolboxes, learning object repositories – which in time will stimulate the creation of new content at local levels, assistance in using and creating learning resources, an engaging community of practice supported by professional development programs and a collection of best practices documents.

The challenge for you now will be to help your organisation find ways to engage – become part of the emerging networks. Consolidation of the Framework’s achievements across policy and individual practitioner development will mean that its impact can be broaden and sustained in the future. (Eklund, 2003) Maturity of the Framework initiative, through mentoring and leadership programs could lead to empowerment of practitioners at local levels who in turn will drive the initiative on their needs.

The key question we need to ask is, ‘How do we encourage people to share their enhanced resources, from a local system, to a national system where everyone can discover them? We need to find an appropriate business model that rewards enhancements to and re-purposing of existing content and contributes it back to a national system. To get the most out of our online resources, we need to find a mechanism to unlock repositories and make learning objects discoverable to enrich learning in Australia.
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