

# Developing e-learning content

Australian Flexible Learning Framework Quick Guides series

Based on the knowledge generated from the Australian Flexible Learning Framework projects and selected external literature, the Quick Guides series provides an introduction to key issues related to flexible and online delivery of Vocational Education and Training (VET).

Reference as:

Backroad Connections Pty Ltd 2003, *Developing e-learning content* (Version 1.00), Australian Flexible Learning Framework Quick Guides series, Australian National Training Authority.

Version 1.00, 31 July 2003

This document can be accessed at:  
<http://flexiblelearning.net.au/guides/content.pdf>

For a list of other Quick Guides see:  
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## Scope

The Guide provides an overview of the processes and some of the things to consider when developing content for e-learning and describes some useful resources that may assist. This Guide is particularly targeted at those working in the Australian vocational education and training (VET) sector.

“Content development” can cover activities of varying scale and complexity – for example, an individual teacher or trainer developing material for a single class, through to large scale projects managed by a multi-disciplinary team. This Guide looks at generic processes applicable to large or small scale projects, however the emphasis and importance of a particular stage or consideration may vary according to the nature and scope of the development undertaken.

## Why is it important?

The development of teaching and learning resources has always been integral to education and training and largely the domain of teachers. Several factors have led to an increased emphasis on content development now as a separate and more specialised activity, and often involving a consultative approach or team effort, or undertaken by people who may or may not be involved in the teaching. Some of the reasons for this relate to the particular nature of online content, for example:

- Good online teaching and learning involves various forms of interactivity and consideration needs to be given to how to effectively design and develop the resources that make best use of the medium, have the right blend of activities, are motivational, accessible, and effective educationally.
- Communication and interaction between students is an important part of effective online learning and this again has implications for content development and may need the involvement of special expertise to build this successfully into the online course or learning content.
- Technical issues play a far bigger role in the development on online content than in traditional print-based resources.
- Large online content development projects typically involve team members from a variety of organisations and this increases the need for more formal methodologies.

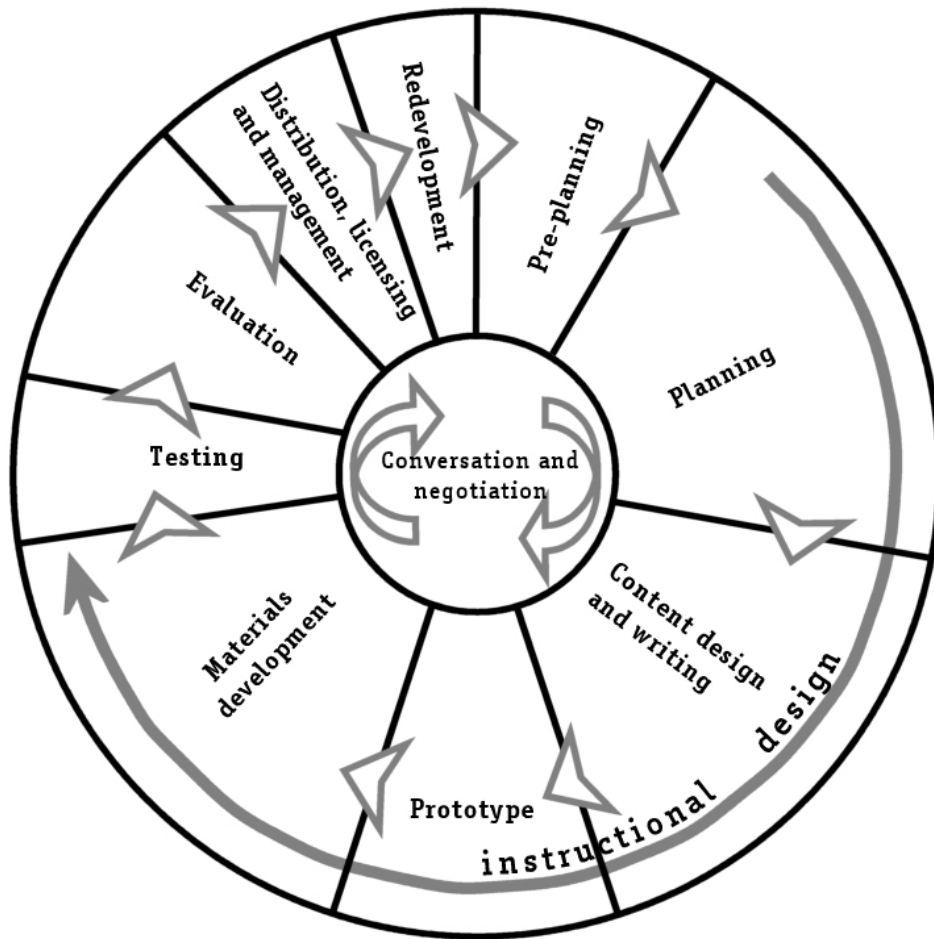
There are also changes which are not just specific to online content, but increase the need for more formal approaches to content development (i.e. involve greater project planning, liaison with others, greater need to fit with external criteria, and so forth). For example:

- the increasing emphasis now on the reuse and adaptability of material (often spoken of under the terms of ‘learning objects’ and ‘flexibility’)
- greater emphasis now given to student and client-centred approaches – developing resources for particular client groups or even individual learners.

## The product development cycle

This section describes the various aspects of the development of e-learning resources in terms of a product development cycle. The cyclical representation is used to emphasise that developing learning resources is an iterative process that builds on existing resources, and that product needs to be evaluated and the results fed back to future activities.

The *Useful Resources* section describes just some of the resources available relevant to particular topics within this cycle.



## Pre-planning

### Establishing the team

Establishing the right team, in terms of balance of skills and ability to work together is a key success factor. The range of skills which might be represented include:

- instructional design
- content matter expertise
- technical expertise
- expertise in resource discovery and information management
- project management.

### Skills audit

Doing a brief skills audit will enable you to assess the existing skills and expertise of your team and identify any additional expertise you might need. The gaps might then be filled by internal professional development, contracting out certain tasks, or seeking extra team members.

## Locating financial resources and obtaining support

A commonly reported issue when reading evaluation reports and experiences of teachers is the under-estimation of both the financial resources and time resources required for online content development. It is important to be clear where the source of funds are coming from (all sources), and gain management support for time release for staff to be involved, **before** a project begins. When estimating expenses, factor in all costs including on-going maintenance and testing.

## Planning

The planning phase is probably the most important. Steps involved include:

- Articulating learning objectives – being clear about and communicating to others in the project team the learning aims and objectives. This includes what you want your students to see, do, and experience, as well as learning outcomes.
- Characterising user (student) requirements – knowing your intended audience, their circumstance, and particular needs.
- Locating and assessing existing learning resources – what materials do you already have, what is available that you can use or adapt, what quality are they and can these form part of your content. Or, who else has done similar work that you can learn from.
- Identifying the need for new content – assess what you have then identify what additional you need to provide for students to achieve mastery and participate online successfully.
- Identifying technical considerations, constraints and possibilities – this needs to be done from the outset and will affect both the design and the scope of your development project.

## Project considerations

Things you might need to investigate further that may need to be included in your project activities include:

- Copyright compliance management – do you know the copyright regulations for online? How will copyright permissions be sought and kept track of? Is there someone who takes care of this in your organisation or who will do this?
- Management of intellectual property – this is about protecting ownership of articles used or material developed. Mostly ownership belongs with an institution or with the organisation funding the development but there are sometimes exceptions particularly when multiple parties are involved. Is there anything you need to consider/manage here?
- Collaboration – will the project involve other people or organisations in other departments, or externally?
- Prototyping – is it worth considering ‘proof-of-concept’ or testing your product before you get too far down the track? National and state funded projects usually require the development of a prototype and concept and user testing as a compulsory part of a project, but there is merits in doing this in all content development – at least getting progressive feedback as you go.
- Impact of learning object paradigm – is your organisation yet to the point where they are considering the use of ‘learning objects’ which in lay terms is a design philosophy and accompanying structures that support the

development and use of discrete learning modules (or 'chunks' of content) that stand-alone or can be repurposed for use in other contexts or by others?

## Managing the project

The importance of good management is self-evident. The role may be undertaken by one person or shared depending on the size and nature of the development and the number of and affiliation of team members involved. Typical project management tasks include: keeping the project on target, team building and relationship management, instigating and managing quality controls, systemising activities if this is going to be more than a one-off occurrence, contractual tasks and so forth.

## Content design and writing

In this phase the processes are often concurrent and iterative. Processes and steps might differ between organisations and for different projects, but broadly steps include:

- Establishing the assessment criteria and methods by which students will demonstrate skills, attributes, and understanding (at stages within the learning as well as at the conclusion). Online offers many more options than a lot of people think. Time spent exploring options here can open up many more ideas for presenting content, and is more likely to produce meaningful and integrated assessment embedded within learning activities.
- Mapping and then sequencing the key elements of the content.
- Applying instructional design effective for online (choosing appropriate teaching strategies; presentation considerations; and building in scaffolding that will support the learners move to independent thinking as they become more familiar with the topic and the medium which is very important to do when learners are not in a face-to-face situation).
- Technical or multi-media decisions (specific technical treatments, next step beyond the broad-brush considerations in the planning phase).
- Deciding what should be presented on screen and what should be downloadable/printable.
- Deciding which is key content, and needs reinforcement, what material can become secondary links, and which comes under the heading of supplementary or additional learning resources.
- Doing a walk-through and check on time allocations for each learning activity (including reading); congruence between assessment and learning objectives and learning content and learning tasks; clarity; and completeness.
- Defining and providing for (either in the content itself or in documentation) the learning support needs of the students, and also for teachers if the material is to be used by others.

## Materials development

This phase takes the material produced in the writing and planning phases and turns it into product. It can either be done during or immediately after the content planning and writing phase, but in either case close liaison should occur between writers and the developers (if these are different people) throughout these stages.

This phase includes:

- producing the physical product

- producing any accompanying documentation (user guides, implementation guides, etc if these are needed, eg the content is a course or total learning product).

### Testing and final checking

An important phase. All your efforts above are of little value if the product is not accessible and usable. Consideration of usability factors actually begins in the planning phase but it should be formally tested during prototyping, then following full production. The importance of testing and considering the usability factors cannot be over-stressed.

These steps require:

- Knowing what standards should be aimed for (technical compliance and usability of the product being developed).
- Establishing means by which to measure or test that standards and usability objective have been achieved.
- Considering when to measure, and how information from this will feed back into the development process to achieve best outcomes most efficiently.

### Evaluation, feedback and redevelopment

Evaluation is a positive step that can provide good feedback on the effectiveness of your product. This feedback can enable fine-tuning of the product. It also provides valuable feedback to the production team on ways future development outputs can be improved.

### Distribution, licensing and management

If the content you have developed is of potential interest beyond your own organisation you need to decide how you will let other people know it is available and on what terms. Questions to be addressed include:

- If your material contains content from external sources, do you have copyright permission to use this in material you sell or make available to other users?
- Are you going to make the material available for free, sell copies, or will you allow others to license your material and modify it for their own use?
- On what basis are you costing the sale or licensing of your material? Just to cover direct production costs, or to recoup some of the development cost?
- Who will manage sales, distribution and licensing? Is your organisation set up to do this or is it better contracted to an organisation that manages a range of materials?
- Who will receive feedback and maintain the currency of the material, especially if it produced by a one-off project?

### Key success factors

While there are many factors involved in successful development of online content, the following have consistently been found to be of particular importance and key to the success of projects:

- Creating a balanced project team (i.e. not dominated by technical people but a good mix of skills and importantly project management and educational design skills).

- Effective planning.
- Good communication within the project team.
- Key features of good online resources, from a student's perspective, include: accessibility (fast to download, easy to read, easy to navigate), use of appropriate online features and good content design, i.e.
  - the learning content is enhanced by careful selection of appropriate and current learning resources
  - is motivational and engaging
  - the learning material is clearly presented and accurate, and appropriate level of instruction given
  - the content is written in appropriate style and format for online, and is complemented with downloadable, printable material (NCVER 2002)
- From a design perspective good learning design involves effective interrelation between learning resources, learning tasks, and learning supports.
- Planning the communication activities to take place between learners, and between learners and teachers.
- Effective educational design is extremely important, but can be negated if product design (interface, navigation, and technical aspects) is not effective also.
- The development of a prototype as a key review and 'sign-off' point prior to detailed development of the whole resource.
- Final testing to ensure that the product meets the technical requirements specified, and can be effectively accessed and used by the intended learner group.
- Development of good documentation so that teachers and learners know how to install, access, use and adapt the resources developed.

## Relevant Framework projects

### Toolbox project

The Framework *Resources for Teaching, Learning and Assessment* Program manages nationally funded activities relating to content development for flexible delivery, including flexible learning toolboxes. The toolbox website at <http://flexiblelearning.net.au/toolbox/> contains many valuable resources for people wishing to acquire or develop resources for e-learning including:

- Information, previews and ordering information of **toolboxes** developed between 1999 and 2002.
- **Toolbox resource collection:** this repository provides access to the entire Toolbox range housing thousands of learning objects. You can perform searches for specific e-learning materials, select the most suitable resources and download them directly from the website for free.
- **Specifications:** a collection of documents covering good practice in educational design; desirable characteristics and deliverables from toolbox development projects; technical specifications and metadata guidelines. <http://flexiblelearning.net.au/toolbox/specs.htm>

- **Reports:** The various evaluations and reports commissioned by the toolbox project contain valuable information about what has been learnt from the development and use of toolboxes.
- The **Toolbox User Forum** is an online community where Toolbox users can communicate with other users, ask the Toolbox management team questions, share learning stories and make suggestions about Toolbox training and delivery methods.  
<http://learnscope.flexiblelearning.net.au/LearnScope/forum.asp?i=15&id=112>

## LearnScope

LearnScope fosters online development through funded professional development initiatives. Practitioners are encouraged to publish and share their experiences and developed tools through the Australian Flexible Learning Community and through presentations at LearnScope forums.

<http://flexiblelearning.net.au/learnscope/>

## Flexways

The Australian Flexible Learning Framework *Flexways* project has developed an online tool for VET teachers, professional development coordinators, and managers to assess skill development needs for the various aspects of online delivery, and to construct a professional development plan accordingly for individuals or a group.

<http://flexways.flexiblelearning.net.au/>

## Legal issues in flexible learning website

This website contains useful resources on a range of legal issues: copyright and intellectual property; content regulation; privacy; freedom of information; telecommunications; and e-commerce and trade practices law. It includes an Information Kit, Scenarios and Legal Questions and Answers, all of which have useful information relevant to production of learning materials.

<http://flexiblelearning.net.au/legal/>

## VET Preferred Standards

The Preferred Standards project developed the preferred standards to be adopted within the VET sector to ensure quality and accessibility of online products and services. The standards have been incorporated into the Technical Requirements developed as part of the toolbox tender process (see the toolbox specifications page above).

## Useful resources

This section describes and links to various resources that you may find useful. The resources are organised according to stages of the product development life-cycle, or listed as 'general' if they cover a number of stages or are on issues of a general nature.

### General resources

- **Developer's Manual for Online Material**  
This TAFE frontiers Guide was produced to provide guidance to developers producing online material for TAFE Frontiers and use on the TAFE VC, but is a useful to any developer producing online learning material within VET. Well presented and easy-to-use it steps through each stage of the development

process providing guidance on key criteria, preferred standards and processes, and makes reference to available templates in some sections.

[http://www.taefrontiers.com.au/static/TF\\_Usability/about.htm](http://www.taefrontiers.com.au/static/TF_Usability/about.htm)

- **People like us: managing an online project**  
This interactive multimedia CD walks through the process of designing and developing online material. Interviews with people in key roles associated with online developments gives insights into tasks involved, things they hadn't predicted, lessons learned from the process, also tips on how to prevent or overcome challenges that present in a typical materials production project. A clear message from this CD is the need for all members of the team to understand the different roles in the process and to appreciate the different skills each brings to the table – to that end this CD is a valuable PD tool to ensure this happens. The CD contains a number of useful resources also.  
[http://www.taefrontiers.com.au/catalogue?action=show\\_resource+id=aes0202502142f+mode=search](http://www.taefrontiers.com.au/catalogue?action=show_resource+id=aes0202502142f+mode=search)
- **Globalisation/Internationalisation of Online Content and Teaching**  
This Quick Guide explores what is currently known about globalisation and internationalisation in relation to online content and online teaching and issues that have particular relevance to the Vocational Education and Training (VET) community within Australia.  
<http://flexiblelearning.net.au/guides/international.pdf>

## Resources on planning and project management

### LearnScope resources and discussions

The LearnScope website provides access to both resource documents and discussion forums. The following items are of particular relevance to content development:

- Soczynski, R 2002, **Instructional Design Elearning Checklist**  
A brief 5-step checklist covering stages of materials development under the headings of: needs assessment, learning design, development, implementation, and evaluation.  
<http://learnscope.flexiblelearning.net.au/LearnScope/projects.asp?Category=33&DocumentID=2725>
- Educational Design for E-Learning Team, OTEN NSW 2003, **Checklist: How to plan/scope your elearning project**  
A document prepared for use by project managers outlining considerations to be addressed, ideally in the project planning phase and considered by all project team members and stakeholders when scoping and planning a development project.  
<http://learnscope.flexiblelearning.net.au/LearnScope/golearn.asp?Category=12&DocumentID=2959>
- Educational Design for E-Learning Team, OTEN NSW 2003, **How to Structure your eLearning Project Plan**  
A checklist explaining key steps and considerations. Assumes the project to be externally funded and involves a joint/collaborative effort – particularly suitable for an organisation undertaking toolbox preparation but contains generic principles relevant to any development project. It covers things to consider in the planning and preparation phase.  
<http://learnscope.flexiblelearning.net.au/LearnScope/golearn.asp?Category=12&DocumentID=2961>

## Collaborative development of content

Quick Guide on **Critical Success Factors for the Collaborative Development of Content to Support Online Learning**. Deals particularly with issues that may arise when the collaboration is between different types of organisations with diverse cultures and expectations, for example an educational institution and a commercial software developer.

<http://flexiblelearning.net.au/guides/collcontent.pdf>

## Managing the project team

- Ivancevich JM, Duening, TN & Konopaske R. 2002, **How to Manage the E-Learning Development Team**, Learning Circuits.  
A good short article. "Assuming that a team of diverse people will immediately bond and become creative producers of marketable e-learning courseware is naïve".  
<http://www.learningcircuits.org/2002/jul2002/ivancevich.html>

## Managing resources – costing issues

- Hartnett, J 2000, **Secrets of E-Learning Pricing Revealed**, Blue Missile Resources  
A short article on the difficulties of predicting the cost of developing online learning resources. Looks at various approaches to estimating costs in addition to the formal 'actual-cost' processes.  
[http://www.bluemissile.com/articles\\_pmqmt.htm](http://www.bluemissile.com/articles_pmqmt.htm)

## Identifying learner needs

- Macquarie University 1999, **Planning Online Courses and Learning Resources: Media production and educational design processes**. This online development resource, amongst other things provides a handy dot point list of ways of obtaining information to establish user profiles, and lists some of the questions you should ask.  
<http://www.cpd.mq.edu.au/e.learning/handouts/PLANNING/processes.htm>
- Brennan R. 2003, **One Size Doesn't Fit All**, Volume 2, Appendix 4 gives a summary of research findings on typical profiles of online learners and things to consider when designing online learning to ensure greater success.  
<http://www.ncver.edu.au/cqi-bin/getpjm?prID=nr0F05>
- **Cross-cultural Issues in Content Development and Teaching Online**  
This Quick Guide explores cross-cultural issues associated with developing content and designing and delivering online courses and support services. Cultural considerations are important in any teaching design. Teaching across cultures (from one place to another, or to different audiences), and the teaching of diverse groups or individuals from different cultures in one setting or dispersed across different geographic locations, presents particular challenges.  
<http://flexiblelearning.net.au/guides/crosscultural.pdf>
- **The Access and Equity Project – various reports and resources**  
The Access and Equity Project undertook research on particular learner groups deemed to be disadvantaged. The reports and resources produced by that project outline findings for the groups investigated and make recommendations on ways of meeting their needs. Studies and some information resources are available on learners with disabilities, learners with English literacy needs, Aboriginal and Torres Strait Islander learners, women learners, rural and remote learners, isolated learners in metropolitan areas,

and learners affected by the digital divide. For a list of studies and resources see:

<http://www.flexiblelearning.net.au/projects/accessandequityonline.htm>

- Kangan Batman TAFE & Challenger TAFE 2002, **Adapting Online Learning Resources for Indigenous Learners: Report of the National Online Product Equity Project to Augment the Series 2 & 3 Horticulture Toolboxes.**

This report documents methods used to adapt two online learning resources in the form of toolboxes for use by Indigenous learners. It looks at the implications of online learning for Indigenous people and provides guidance on how to develop appropriate online resources. It is essential reading for anyone producing online material for predominant use by Indigenous people. It provides checklists, guides on design criteria, a list of further reading, links to useful resources, and contact details of key organisations in the appendices.

<http://flexiblelearning.net.au/toolbox/reports.htm>

### Guidelines on learning design

- Oliver, R (nd) **National Toolbox Series 5 Workshop – Teaching and learning online**  
Power Point presentation by Ron Oliver, Edith Cowan University to step online developers through good practice in educational design.  
<http://flexiblelearning.net.au/toolbox/specs.htm>
- Brennan, R E, McFadden M, and Law, E 2000, **Focus on Teaching and Learning Issues** (commencing pg 24), in All That Glitters is Not Gold. Discusses teaching and learning issues associated with online delivery and design, including web pedagogy, student learning styles and levels of user skills.  
<http://www.ncver.edu.au/cgi-bin/gda.pl?id=2031>
- McRae D, 2001, **What to make, and why: Principles for the Design and Development of online curriculum content**  
A lengthy guide on content development produced for the school sector, gives good coverage of instructional design theories and relates them in a useful way for application. Particularly useful for those not understanding the significance of or differences between such terms as 'constructivist', Gagne's model, problem-based learning etc. – explains all and then puts meaning to them by suggesting how these relate to online learning design.  
<http://www.thelearningfederation.edu.au/> (under 'Feasibility and Planning Reports')

### Guidelines on learning material / product development

- **Toolbox specifications**  
The various specifications developed by the Toolbox project are described above.

### Finding and licensing existing resources

It is always worth reviewing existing resources before commencing development of new e-learning resources. There is a vast array of existing materials in the VET sector. They may not exactly meet your needs, but in most cases you can negotiate licensing rights to modify the material for your own use. Even if you will not directly use existing materials, a review will prompt ideas on content and teaching ideas that you can use.

- Search the **Toolbox resource collection** (described above).
- The **Online Guide to Resource Catalogues** provides a concise set of web pages that describe the major registers (or catalogues) of VET flexible learning resources. The Guide provides a description of the major registers of VET learning resources in Australia with links to their websites. The description of each register covers the scope of the site, including the quantity and nature of material as well as the types of services it offers (eg whether materials need to be purchased).  
<http://flexiblelearning.net.au/resourceaccess/>
- **AEShareNet** lists thousands of training materials which are available for licensing.  
<http://www.aesharenet.com.au/>

## Copyright and intellectual property management

In addition to the **Legal issues in flexible learning project** material described above – which we suggest should be your first port of call on these issues – the following provide an introduction to copyright issues in the development of educational resources.

- **Australian Copyright Council**  
The Australian Copyright Council provides information sheets on many topics including some specific to education.  
<http://www.copyright.org.au/>
- **AEShareNet Resources on Understanding Copyright**  
Documents created by AEShareNet to explain copyright issues as they relate to education and training in Australia.  
<http://www.aesharenet.com.au/resources/copyright/>
- **Copyright and Distance Education: Trainers' Kit**  
Although not specific to Australian copyright law, this Commonwealth of Learning publication provides an authoritative and user-friendly guide to copyright issues related to education and training. It provides good coverage of background information on need for and different types of copyright, things you need to know when producing or using learning material, and provides instruction on dealing with copyright issues. Includes good tips.  
<http://www.col.org/copyrightTK.htm>

## Resources on ensuring accessibility

- **What is Universal Design and How Can it be Implemented?**  
This Quick Guide provides an introduction to the principles of Universal Design, identifies the contribution of particular projects within the Australian Flexible Learning Framework to understanding and implementing Universal Design, and lists relevant resources on both the philosophy and practical implementation of Universal Design.  
<http://flexiblelearning.net.au/guides/universal.pdf>
- **Option keys: developing accessible websites**  
A website developed by TAFE NSW to assist all TAFE online teams in developing online resources and websites which can be easily accessed by all users. Includes background on the rationale and legal requirements for accessibility as well as practical guidelines and tools for planning, designing and testing accessible websites. Includes an extensive glossary and reference section.  
<http://www.oten.edu.au/optionkeys/>

- **Access and Equity in Online Learning Guides and Reports**  
You can link to the guides and reports produced by the Access and Equity project through the project website at:  
<http://flexiblelearning.net.au/accessequity/>

This page also links to the “Everyone Online – Tutorial” designed to show managers and practitioners simple techniques they can use to design and develop accessible e-learning products.

## Resources on testing and technical compliance

- TAFE Frontiers, **Usability Testing for VET Developers**  
[http://www.tafefrontiers.com.au/static/TF\\_Usability/index.htm](http://www.tafefrontiers.com.au/static/TF_Usability/index.htm)

## Resources on evaluation and review

- **Evaluation Tools for Flexible Delivery. Editable Version**  
Produced by TAFE frontiers. 2001. A useful and comprehensive resource developed for the VET sector to adapt for local or specific needs.  
<http://www.tafefrontiers.com.au/static/projects/evaltool.pdf>
- **How to evaluate courseware**  
Evaluation tools and checklists produced by South East Metropolitan College of TAFE 2000 LearnScope Team.  
<http://learnscope.flexiblelearning.net.au/LearnScope/golearn.asp?Category=12&DocumentID=502>

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[http://flexiblelearning.net.au/toolbox/documents/Series\\_1\\_Evaluation.pdf](http://flexiblelearning.net.au/toolbox/documents/Series_1_Evaluation.pdf)

SALT (specifications for Accessible Learning Technologies).

<http://ncam.wgbh.org/salt/>

Smith, A. 2002. *Understanding Web Page Accessibility: A focus on Access for the Visually Impaired*. TechKnowLogia International Journal of Technologies for the Advancement of Knowledge and Learning. Online Journal. July-September. (note – requires registration, but registration is free)  
<http://www.TechKnowLogia.org/welcome.asp?IssueNumber=17>

The Learning Federation Schools Online Curriculum Content Initiative website.  
<http://www.thelearningfederation.edu.au/>

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