

EDUCATION SERVICES AUSTRALIA

ACCESSIBILITY specification for content development

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1.0 Introduction

This *Accessibility specification for content development* has been developed by Education Services Australia to describe our accessibility principles and requirements and to provide guidelines for creating accessible online curriculum resources for use in the National Digital Learning Resources Network (NDLRN).

The Accessibility Specification is part of Educational Services Australia's suite of quality assurance specifications. These specifications are all embedded within the larger context of educational value. Educational value relates to providing online curriculum resources in appropriate interactive multimedia formats to meet pedagogical aims. Educational value is the major design principle underlying the development of online curriculum resources available in the National Digital Learning Resources Network.

Educational Services Australia is developing resources that maximise learning opportunities for students in an online multimedia environment. Some of the learning opportunities build on the synergies of processing information presented in more than one medium. Therefore, the accessibility approach used by Educational Services Australia is fundamentally different from that used for producing print materials in electronic formats. In particular, educational considerations limit the degree to which multimedia content can be tailored for all users. Through this accessibility specification, Educational Services Australia aims to ensure learning outcomes are optimised for all students.

This specification provides information to support the development of online resources to be accessed using web browsers on desktop, laptop and netbook computers. It does not provide guidelines for devices using touch-screen navigation. Educational Services Australia is currently investigating options for the creation of online resources that conform to our accessibility requirements on tablet and smart phone devices. The specification will be updated to include these devices in the middle of 2012.

2.0 Purpose

This specification will guide the creation of accessible learning resources for the NDLRN. The specification helps Educational Services Australia to fulfil commitments made in its *Disability Action Plan* and its obligations under *The Disability Discrimination Act (DDA) 1992*.

3.0 Leadership obligations of Education Services Australia

Educational Services Australia will fulfil the following legislative and leadership obligations in delivering online resources in the National Digital Learning Resources Network (NDLRN):

- To develop learning resources that meet the relevant provisions of the *Disability Discrimination Act 1992*.
- To proactively review and, as appropriate, incorporate relevant accessibility guidelines not yet specified in legislation.
- To ensure that the Accessibility specification meets the online communications obligations of the schools' sector under the *Disability Discrimination Act 1992* and that it improves the Australian education sector's capability in this area.
- To contribute to national and international standards development in the area of accessibility and educational multimedia.
- To consult with relevant organisations and user groups in establishing, implementing and reviewing this Accessibility specification.
- To draw on accessibility expertise in the formulation and use of a content design methodology and quality assurance processes.

4.0 Application

The Accessibility specification will be used to assess all resources developed for the National Digital Learning Resources Network.

This specification will also be applied to non-commissioned content proposed for inclusion in the NDLRN. Educational Services Australia realises, however, that not all of this specification may be applicable to non-commissioned content. Educational Services Australia will not necessarily exclude non-commissioned content that deviates from this specification.

5.0 Maintenance

The specification will be revised to take in changes in standards, technology, hardware and use of content. Updated specifications and related guidelines will be published on the [National Digital Learning Resources Network website](#) .

6.0 Conformance

The Accessibility Specification is embedded within the larger context of *educational value*. Educational value relates to providing online curriculum resources in appropriate interactive multimedia formats to meet pedagogical aims. Educational value is the major design principle underlying the development of online curriculum content by Educational Services Australia.

It is not always possible to create a single piece of content that meets a particular educational objective and is universally accessible (see section 9.0 Designing for accessibility and educational value). For this reason, achievement of this specification will take into consideration the educational objectives of the learning resource being assessed, as well as the accessibility of the overall pool of resources being developed.

Conformance to this specification will be measured by adherence to the principles described in section 7.0 Principles, and the measures and requirements described in section 10.0 Accessibility requirements.

7.0 Principles

The specification will be used to assess whether online curriculum resources conform to the following principles:

- Legislative compliance
- Appropriate interactive-resource design
- Access device independence
- Flexibility of operation and presentation
- Communication of accessibility information with content
- Equitable user system requirements.

7.1 Legislative compliance

This principle aims to ensure that Educational Services Australia complies with the *Disability Discrimination Act 1992*, and supports education systems in complying with state and territory laws pertaining to online content accessibility.

7.2 Appropriate interactive-resource design

This principle enshrines Educational Services Australia's commitment to providing exemplary online learning resources in formats that meet both pedagogical and accessibility aims and the needs of users with varying capabilities and individual learning differences. It also encompasses the need for all resources produced to be designed for accessibility, including content that cannot itself be made to comply with universal accessibility standards. In such cases, equivalent or alternative curriculum content may be required.

7.3 Access device independence

This principle recognises that teachers and students will utilise a range of devices, in a range of situations to access online learning resources. In particular, for some users with disabilities, it acknowledges their reliance on assistive devices to harness the capacity of computer technology in both educational and personal environments. Device-independent resources are designed to work effectively in web browsers on desktop, laptop and netbook computers.

7.4 Flexibility of operation and presentation

This principle optimises teacher and student interaction with online resources through flexible operation and presentation while accommodating diverse learning contexts and varying user constraints. It recognises the need for users, especially those with disabilities, to determine what will make their access easiest in a given set of circumstances. It also recognises that online resources should allow graceful transformation of content into different renderings for different devices and easy repurposing of content for different users.

7.5 Communication of accessibility information with content

This principle acknowledges the role of metadata in the communication of accessibility information. It requires the definition and incorporation of accessibility metadata into online resources.

7.6 Equitable user system requirements

The final principle allows for a range of users, including those with low-performance machines and/or low bandwidth. It also provides for the determination of a minimum specification of user hardware and software for equitable and inclusive provision of project resources and services.

8.0 Accessibility user profiles

Educational Services Australia has defined four high-level accessibility user profiles:

- vision impairment
- hearing impairment
- physical impairment
- cognitive impairment.

These accessibility profiles are high-level categorisations of groups of learners that are used within content design and development to guide appropriate learning resources design. The profiles are used during resource development in two ways:

- to determine whether a learning design can support a particular accessibility profile, or whether an equivalent or alternative realisation is required (see section 9.0 Designing for accessibility and educational value)

- to indicate the accessibility of content to the profiled group of users via metadata (see section 11.0 Accessibility metadata).

Additionally, technical and design requirements and guidelines for supporting these profiles are documented in section 10.0 Accessibility requirements. Creation of these requirements was informed by Educational Services Australia's experience in the development of accessible and educationally sound learning resources.

8.1 Vision impairment

Vision impairment includes tunnel vision, loss of vision in different parts of a person's visual field, colour blindness, poor acuity (clearness of vision), loss of centralised vision and severe vision impairment. Complete blindness is not the most common vision impairment. Students may be born with vision impairment, or may become vision impaired through illness or accident.

Colour blindness is a common type of vision impairment. Approximately one in ten boys has some degree of colour blindness. Although there are various types of colour blindness, nearly all colour-blind people have difficulty distinguishing between red and green. Most colour-blind people can detect black and white accurately. The majority can also distinguish between shades of blue and yellow.

Assistive devices used by visually impaired students include:

- text-to-speech converters
- screen readers and talking browsers
- larger monitors (19-inch, 21-inch or 23-inch widescreen)
- use of text display settings on computer systems or web browsers
- screen magnifiers
- optical character recognition programs
- refreshable Braille displays
- Braille embossers
- personal data assistants (Braille display).

8.2 Hearing impairment

Complete deafness is not a common impairment in the student population. It is rare to encounter a completely deaf student who cannot read or write, or communicate in English.

Students with a hearing impairment are often provided with assistive listening systems (ALS) that increase the volume of the teacher and other students without introducing additional background noise. Some students have cochlea implants, or hearing aids with volume control. For hearing-impaired students, background noise encountered in mainstream schools can cause learning difficulty. They can become frustrated and distracted when they cannot hear clearly.

Hearing-impaired students may be born with a hearing impairment or become deaf through an accident or infection. Some hearing-impaired students have Auslan (signing) as their first language; English (written) is their second language.

Many hearing-impaired people – particularly if they are sign-language users – do not have highly developed reading skills. Sign language is a different language from standard written English. Some people who use sign language therefore have a limited reading vocabulary.

8.3 Physical impairment

There are many different types of physical impairment, and people can have more than one type of physical impairment. These may include fine and gross motor impairment, sporadic and intermittent movement, limited movement and limited motion, or their ability to manipulate objects and to interact with the physical world may be affected. People may have acquired a brain injury through accident or trauma, and may experience limited movement to the arms, legs or trunk. They may have conditions such as cerebral palsy, spina bifida, arthrogryposis or degenerative conditions such as muscular dystrophy, Batten-Mayou disease or Friedreich's ataxia.

People with these types of disabilities use computer systems with add-on assistive technologies. These technologies include switches, large mice or trackballs, speech-recognition software, onscreen keyboards in combination with pointing devices, word-prediction software, keyboard guards, programmable keyboards or overlays, and compact keyboards. Assistive devices are tailored to the unique needs of the user, as a combination of devices may be required. For example, the user may require speech recognition in conjunction with an onscreen keyboard and head-pointing device.

8.4 Cognitive impairment

Cognitive impairments affect mental processing, reasoning, language and memory. These impairments may also exist in combination with other impairments.

Students may have been involved in an accident resulting in brain damage, or may have congenital learning problems. Those suffering severe cognitive impairment are less likely to be in mainstream schools and more likely to be found in the special school system.

9.0 Designing for accessibility and educational value

Educational Services Australia commits to maximising the accessibility of all online resources within the context of educational value. Educational value relates to providing online curriculum content in appropriate interactive multimedia formats to meet pedagogical aims. Educational value is the major design principle underlying the development of all online curriculum resources by Educational Services Australia.

Educational Services Australia balances educational value and accessibility requirements by taking a universal design approach to resource development.

9.1 Universal design process

Universal design for learning¹ holds that content should be accessible and appropriate for individuals with different backgrounds, learning styles, abilities and disabilities in widely varied learning contexts.

It recognises that it is not always possible to create a single piece of interactive multimedia that meets a particular educational objective and is also universally accessible to all students. In such cases, equivalent or alternative curriculum content may be required. In other cases it may not even be possible to support a given accessibility profile for the given educational objective in the chosen interactive multimedia format.

Educational Services Australia has developed resource creation and quality assurance processes that ensure all online learning resources have educational value and respond to the differentiated profiles of learners, including profiles of learners with a disability. The content and quality assurance processes include a series of questions that direct resource development to maximise accessibility without compromising educational value (see Figure 1 on page 8). For a given educational objective, resource developers are asked to consider the educational and technical implications of supporting each of the accessibility profiles.

These questions are used to determine the scope of accessibility support within a pool of curriculum resources supporting a specific educational objective. The questions help define the collection of learning resources needed to support the combination of educational objectives and accessibility profiles. When an educational objective is unable to be represented adequately in all media modes within the same learning resource, alternative representations of the learning resource are developed. Where an alternative representation is not appropriate, either for reasons of educational value or unjustifiable hardship, these decisions are documented through the process of considering these questions.

¹ Universal Design for Learning <http://www.cast.org/udl> 

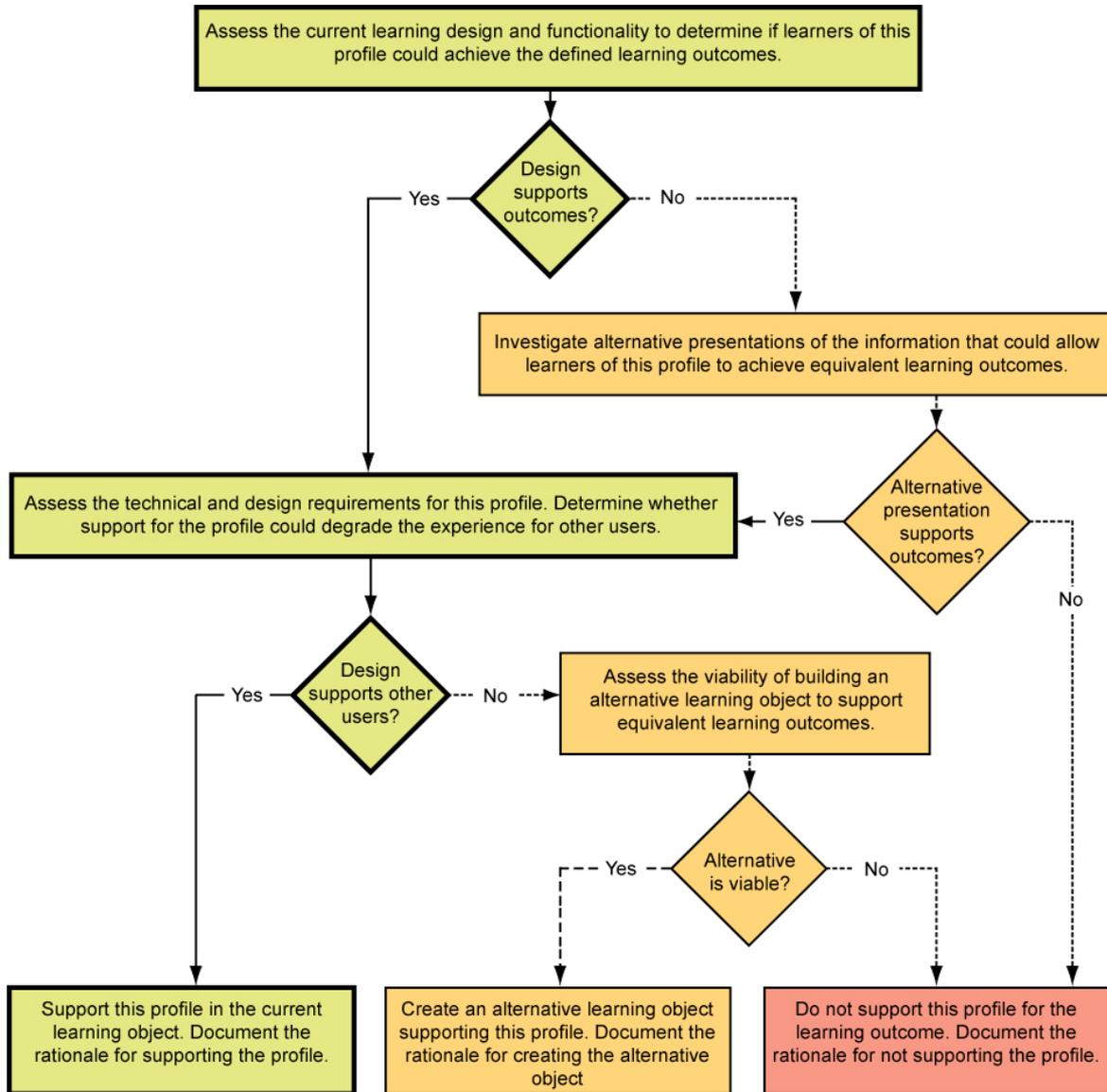


Figure 1. Process for determining support for a learner process

10.0 Accessibility requirements

10.1 General accessibility requirements

The Educational Services Australia accessibility requirements follow the *Web Content Accessibility Guidelines* version 2.0 (WCAG 2.0) developed by the W3C Web Content Accessibility Initiative. WCAG 2.0 has been adopted by the Australian Government as the standard to be applied under the *Disability Discrimination Act 1992*. The Australian Government Information Management Office (AGIMO) is the government agency managing the transition of all government websites to conform to WCAG 2.0. All government websites (including those managed by states and territories) created after July 2010 must be level A (single A) compliant by 31 December 2012 and level AA (double A) by 31 December 2014. The Australian Human Rights Commission (the agency responsible for any complaints under the Disability Discrimination Act) expect that all non-government websites be level AA (double A) compliant by 31 December 2013.

Educational Services Australia requires that all new websites and digital resources that are being hosted on NDLRN repositories are produced to meet level AA (double A) success criteria. All content linked from the Metadata Exchange (MEX) should conform to level AA (double A). The level of accessibility available will be a key consideration in the selection process and continued availability of content from NDLRN. Educational Services Australia will work with website and digital resource producers to assist them in meeting this requirement.

It is important that the accessibility requirements are included in the authoring and design processes for website and digital resources from the start. The W3C has developed the [Authoring Tool Accessibility Guidelines](#) (ATAG) and the [User Agent Accessibility Guidelines](#) (UAAG) to assist producers and developers in creating accessible products. Designing online resources with consideration of the general accessibility requirements will also provide functionality to enable: flexibility and accessibility, device independence and colour independence.

Flexibility and accessibility

The universal design approach may require development of alternative representations of content for different learner profiles. These alternative representations will often share common online resources (such as instructional text). Creating alternatives requires that the common resources shared by the alternative representations are kept in synchronisation.

One technique for synchronising alternative content representations involves the separation of structure, presentation and functionality. Educational Services Australia's *Technical Specification Guide for Online Resources* describes technologies that support separation of structure, presentation and functionality.

Device independence

All content procured by NDLRN should be designed to be device independent.

Colour independence

All content procured by NDLRN must be accessible to learners who are colour blind.

10.2 Supporting accessibility profiles

Developers engaged by Educational Services Australia will be provided with further accessibility guidance and feedback during resource development and quality assurance. In particular, developers will be provided with guidance on supporting the Educational Services Australia accessibility profiles in the context of the educational goals of the resources.

Based on this experience, Educational Services Australia is developing design requirements that support each of the accessibility profiles. These requirements will be incorporated into future versions of this specification.

11.0 Accessibility metadata

Educational Services Australia adds standards-based metadata to all digital learning resources. Definitions for all metadata elements are published in the *ANZ-LOM Metadata application profile*. The metadata includes an *Access profile* element used to indicate which accessibility profiles have been considered in the design of the resource.

An access profile is assigned within the metadata for content that has been specifically designed to facilitate the learning experience for users who match that profile and for which all of the technical requirements outlined in the *Technical Specification Guide for Online Resources* for that profile have been met. On that basis it can be assumed that the resource provides some help to users typical of the profile. The resource is not, however, guaranteed to be suitable for all learners in the designated profile.