

# Information and Communication Technology (ICT) competence



## *Conceptual statement*

### **Introduction**

In the Australian Curriculum students develop ICT competence as they learn to use ICT effectively and appropriately when investigating, creating and communicating ideas and information at home, at school, at work and in their communities.

Developed economies and societies are increasingly built on the ICT competence of workers and citizens. The Melbourne Declaration on Educational Goals for Young Australians states that ‘In this digital age, young people need to be highly skilled in the use of ICT’ (MCEETYA 2008, p.5), and, while schools already employ technologies in learning, they ‘need to increase their effectiveness significantly’ over the next decade. To be successful learners at school and beyond, students need to become ‘creative and productive users of technology’ (MCEETYA 2008, p.8), equipped with the necessary knowledge and skills to use ICT in contemporary learning and living.

Information and communication technologies transform the way students think and learn as they support risk-taking and knowledge sharing. These technologies are fast and automated, and interactive and multimodal, and allow students to control how and when they learn. Specific requirements change according to the needs of individuals to find solutions to problems or to construct and communicate their learning.

The ICT competence conceptual statement and continuum describe the nature, scope and sequence of learning for ICT competence in the Australian Curriculum. These materials can assist schools and teachers across the learning areas to plan for and support student development of ICT competence.

### **Scope of ICT competence**

Students develop competence in using ICT for tasks associated with information access and management, problem solving, decision making, communicating, creative expression, and empirical reasoning. It is also essential that students develop knowledge, skills and understanding around the fundamental logic and conventions underpinning ICT use and the ability to transfer these from one ICT environment to another (such as from school to workplace and to other social contexts). Equally important is the manner in which ICT is used, based on an understanding of the technology’s limitations and its impact on individuals, groups, communities and organisations.

Students develop ICT competence when they:

- Apply appropriate social and ethical protocols and practices in managing and operating ICT
- Manage and operate ICT: applying technical knowledge and skills; managing data and information efficiently, effectively and appropriately and interacting with ICT for learning
- Investigate with ICT: planning and refining information searches; locating and accessing different types of data and information and verifying the integrity of data when investigating questions, topics or problems
- Create with ICT: using ICT to generate ideas, plans, processes and products to create solutions to challenges or learning area tasks
- Communicate with ICT: exchanging ideas and information with others while adhering to social protocols appropriate to the communicative context (purpose, audience and technology). The diagram



below sets out the elements of ICT competence and illustrates the relationship between them. An understanding of the nature and scope of ICT competence is not fixed but is necessarily responsive to ongoing technological developments. This is evidenced by the emergence of advanced internet technology over the past few years and the resulting changes in the ways students construct knowledge and interact with others.



Elements of ICT Competence

### Terminology

Information and communication technology specific terminology is constantly growing and changing. Information and communication technology encompasses the range of digital-related hardware and software used to support the capture, storage, transmission and retrieval of data. Besides computers, this can include peripheral devices such as scanners, printers and speakers; mobile devices such as mobile phones; and hand-held devices such as digital cameras, digital media players, calculators and data probes. The following online glossary provides regularly updated lists and definitions of ICT terminology:

[http://hsc.csu.edu.au/info\\_tech/glossary/2327/common\\_terms.html#a](http://hsc.csu.edu.au/info_tech/glossary/2327/common_terms.html#a)

### ICT competence across the curriculum

Students develop and apply skills in investigating with ICT across all learning areas. They use ICT to access data and information from a range of primary and secondary sources when investigating questions, topics or problems. Students use ICT to create solutions to challenges or problems, developing skills in creating with ICT, and use ICT to communicate ideas and information to others, considering purpose, audience and technology, developing skills in communicating with ICT. Students apply technical knowledge and skills and appropriate social and ethical protocols and practices to investigate, create and communicate, and in so doing develop their skills in managing and operating ICT.



## **ICT and the Technologies learning area**

In addition to the general capability ICT competence, ICT will also be addressed through the Technologies learning area, which comprises two subjects: Design and Technology and ICT. While the Technologies learning area in the Australian Curriculum is yet to be developed, it is expected that ICT as a subject will reflect the key elements of national and international curriculums.

The key difference between the general capability ICT competence and ICT as a subject is that students studying ICT as a subject should develop more sophisticated understandings of the relationship and interconnectedness between ICT hardware and software. This enables students to understand the structure and operation of networks and feel confident in designing network and software solutions for authentic situations, taking into account social, legal and ethical considerations.

In the Australian Curriculum ICT competence is identified in learning area content descriptions and content elaborations. A filter for general capabilities makes it possible to see wherever ICT competence has been identified in the F-10 curriculum.

## **Theoretical framework**

Information and communication technology competence is based on sets of relevant understandings, knowledge, attitudes and skills. Internationally, such competence is typically represented developmentally. In this case, students demonstrate increasing levels of competence as they move through phases of schooling and have increasingly sophisticated experiences with the technology. For example, the ICT curriculum for England presents 'lines of progression' through the years of schooling. The Australian Council for Educational Research (ACER) has also identified a progression of ICT competence in research associated with the National Assessment Program.

To identify the development of ICT competence and to assist teachers in providing appropriate information and experiences, ICT knowledge, skills and attitudes are typically represented in interrelated domains. For example, in the ICT curriculum for England these domains are referred to as strands and sub-strands. In the USA, the National Education Technology Standards (NETS) for students provided by the International Society for Technology in Education (ISTE) represent competence with six sets of standards.

The continuum for ICT competence has been developed in reference to these and other international and national scope and sequence models. In particular, it is based on the structure of the NETS for students provided by ISTE. This was adapted initially with reference to the framework developed by ACER for the National Assessment Program, then with reference to the ICT curriculum for England, and finally with frameworks from a number of Australian state education authorities.

The ICT competence continuum is structured around interrelated elements of activity (Investigating, Creating, Communicating and Managing and operating) conducted within a context of Social and ethical protocols and practices. The element concerned with Social and ethical protocols and practices was transformed from the NETS Digital Citizenship standards for students performance indicators. The standard's areas of Technology Operations and Concepts and Communication and Collaboration were transformed to create the Managing and operating and Communicating elements respectively. A combination of the standards for Creativity and Innovation and Critical Thinking, Problem Solving, and Decision Making formed the basis for the Creating element. The Investigating element was built from the Research and Information Fluency set of standards.



## References

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## Further Reading

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