



Australian Government

Department of Education, Employment and Workplace Relations

ICTSUS8237A Lead applied research in ICT sustainability

Release: 1

ICTSUS8237A Lead applied research in ICT sustainability

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to plan, conduct and report on applied research to influence strategic practices on ICT sustainability and outcomes within an organisational context. The unit also covers constructing an applied research strategy, using a range of applied research techniques, and analysing and presenting findings. The competitive context and the evolution of technologies in the ICT sector mean that the capacity to innovate is important. Energy and climate change strategies, supply chain and product responsibility and innovation are key factors in achieving sustainability targets. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.
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Application of the Unit

Application of the unit	This unit applies to leaders or enterprise managers using applied research to enhance individual, team and organisational performance in sustainability. The intended purpose and approach to applied research may vary across a range of contexts and organisations. In this unit, the focus is on applied research to attain improved organisational outcomes. It involves leading a range of research activities and techniques that, in combination, can provide quality information to enhance the development of capabilities in an enterprise to reach sustainability targets.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Not Applicable

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
1) Provide direction for the development of an applied research strategy for ICT sustainability	1.1 Provide vision for the <i>applied research strategy</i> to meet the sustainability requirements of the identified research purpose 1.2 Clarify and confirm <i>applied research purpose</i> and needs of the <i>target group</i> 1.3 Facilitate the development of policies and procedures in relation to conducting applied research for the enterprise 1.4 Guide the development of mechanisms for collecting and maintaining data in a systematic manner 1.5 Review <i>factors affecting the reliability and validity of data</i> 1.6 Review relevant research ethics and codes of conduct
2 Control the use of a range of applied research techniques and resources	2.1 Review and evaluate a range of <i>applied research methods and theories</i> and <i>data collection techniques</i> 2.2 Guide the selection of appropriate methods to gather and analyse data on sustainability relevant to the research project 2.3 Authorise access to <i>appropriate sources of information</i> relevant to the research project 2.4 Select <i>sustainable management principles</i> that will have the most sustainable impact on the project 2.5 Ensure <i>relevance of the research</i> through integrity of the data collected and analysis tools used
3 Promote findings	3.1 Ensure accuracy of data and research details and adherence to any <i>legal requirements</i> 3.2 Evaluate the relevance of collated and analysed data against the original applied research strategy 3.3 Evaluate the impact of findings 3.4 Recommend implementation strategies 3.5 Ensure documentation and presentation of <i>research findings</i> is in a clear and logical manner consistent with audience needs 3.6 Identify the need for and an appropriate approach to, further research 3.7 Promote research findings and the approach to further research

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to:
 - analyse and interpret structurally intricate information in the area being researched
 - evaluate effective technical solutions in sustainability implementation
- communication and teamwork skills to:
 - consult with target groups using a range of communication techniques
 - develop written texts which deal with complex ideas and concepts
 - present research findings creatively to meet audience needs
- literacy skills to:
 - document technical requirements and procedures
 - evaluate complex and formal documents such as policy and legislation
 - prepare written reports requiring precise formats and structures to suit target audience
- numeracy skills to:
 - analyse and confirm research findings such as carbon dioxide (CO₂) emissions and carbon footprint
 - perform statistical analysis of trends and changes
- initiative and enterprise skills to discover and source appropriate information, and to identify future implication of information and data collected
- planning and organising skills to:
 - construct an applied research strategy
 - initiate and design research methodology
 - manage an applied research project
- problem solving skills to:
 - analyse research
 - check the integrity of data collected
 - collect, organise, analyse and present data
 - conduct trend analyses
 - develop and examine the validity of the applied research strategy using a range of applied research techniques
 - evaluate a range of sustainable management principles
- self-management and learning skills to:
 - conduct research to develop capabilities and learning related activities
 - manage own time and determine priorities

REQUIRED SKILLS AND KNOWLEDGE

- review and adhere to relevant ethics and codes of conduct
- store data to maintain privacy and confidentiality of information
- technical skills to:
 - select suitable technology and technical services
 - use a range of software tools to analyse technical data
 - use technology and web media to discover, access, collect and store data, information and research in a systematic manner
- leadership skills to:
 - set research directions, make decisions and solve problems
 - manage, guide and influence research team members
 - communicate, motivate and facilitate research team interactions

Required knowledge

- environmental and sustainability legislation, regulations and codes of practice applicable to industry and organisation
- audit methodology on ICT energy, waste, product life cycles and CO₂ emissions
- principles, practices and available tools and techniques of sustainability management relevant to the telecommunications industry
- communication processes and methods
- data collection methods
- legislation, regulations, policies, procedures and guidelines relating to handling or storing data, including privacy and freedom of information
- presentation techniques
- reporting methods
- research ethics and codes of conduct
- research tools and methods
- selection of appropriate applied research techniques
- leadership strategies relevant to a research environment

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the ability to:

- lead the formulation of a research proposal or plan which includes:
 - specific research questions on sustainability
 - valid population or sample size
 - description of the geographical, cultural, social or institutional context within which the research will be carried out
 - full description of the data collection methods
 - analysis of the limitations to research design
- lead the design of an applied research project using appropriate tools and techniques
- design a research report with analysis of data, and valid and reliable findings
- evaluate relevance of the research results
- apply knowledge of applied research techniques.

Context of, and specific resources for assessment

Assessment must ensure:

- research activity that relates to an actual workplace or simulated context and topic
- range of tools and techniques appropriate to the given situations and research topic.

Methods of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate
- review of projects relating to conducting applied research conducted by the candidate
- direct observation of the candidate applying research skills
- oral or written questioning to assess knowledge of applied research.

EVIDENCE GUIDE**Guidance information for assessment**

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICTSUS8238A Conduct and manage a life cycle assessment for sustainability.

Aboriginal people and other people from a non-English speaking background may have second language issues.

Access must be provided to appropriate learning and assessment support when required.

Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed.

In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Applied research purpose may be • agreements

RANGE STATEMENT	
contained in documents such as:	• research brief • research contracts • research guidelines • research statement.
Target group may include:	• community • content and media provider • end users • equipment vendor • government authority • investors • regulator • society • statutory authority • sustainability auditors • telecommunications service provider • user groups.
Factors affecting reliability and validity may include:	• access appropriate population • authenticity and reliability of data sources • capacity to generalise findings across the whole population • sample size • type or survey used to increase validity.
Applied research strategy may cover:	• analysis of industry specific trends, statistics and issues • collection of data to assist informed decision making, planning or risk management • data and information relating to strategy, policy, practices, or work processes developed and implemented by an organisation • formation of solutions to complex problems • information and analysis needed to develop a campaign, strategic plan, industry or sector plan and strategy, or to bargain effectively with employers • information and analysis to conduct a strategic or community campaign or activity • relationship or relevance of a theory, principle or practice to an immediate practical problem, issue or to test a proposed solution.
Applied research methods and theories may cover:	• methods such as: • action research

RANGE STATEMENT	
	• case study • experience and intuition • experiments • interviews • mathematical models and simulations • participant observation • surveys • statistical data analysis • statistical surveys • content, textual analysis, theories and techniques, which will vary upon consideration of: • application of statistical methods • causal factors and dependant or independent variables • critical analysis • experimental, quasi-experimental, non-experimental • mathematical calculations • problem solving • qualitative or quantitative research • sampling and sample size.
<i>Data collection techniques</i> may include:	• collaboration with other experts or mentors • desk research • document research • field study • observation • physical items analysis • interviews • questionnaires • surveys.
<i>Appropriate sources of information</i> may include:	• Carbon Pollution Reduction Scheme (CPRS) • discussions with current industry practitioners and manufacturers • energy and climate change reports and policies • government departments • industry associations and organisations • industry standards • AS/NZ3598:2000 (or latest revision):

RANGE STATEMENT	
	• Level 1 consumption benchmark • Level 2 preliminary assessment • Level 3 economic analysis • BS EN 16001:2009 Energy Management Systems • ISO 14001:2004 Environment • industry journals • Kyoto protocol documentation • organisational policies, procedures and journals • personal observations and experience • professional organisations • research papers, technical publications and manuals • web data from research establishments and universities.
<i>Sustainable management principles</i> may include:	• audit waste management procedures • improving efficiency of ICT network equipment: • reducing air conditioning requirements • shutting down of equipment during low demand and prolonged idle times • procurement strategies: • assessment of suppliers' environmental policies and procedures • lowering of energy consumption or environmental impact of replacement products or services • managing the environmental impacts of electrical and electronic equipment • use of energy consumption and environmental impact as criteria in the process of awarding contracts • supply chain: • driving ethical values through the supply chain • engaging supplier's involvement in emissions reporting and continual improvement • engaging suppliers who provide information on energy consumption and product life cycles

RANGE STATEMENT	
	• influencing suppliers to provide energy efficient products and services • total life cycle (TLC) analysis of product, processes and services.
Relevance of the research may be based on:	• available time and resources • feasibility of implementing the recommendations • findings of previous and current research • original research parameters and brief • quality and credibility of the methodology • value of its usefulness • value of the information and data.
Legal requirements may include:	• agreements with third parties that supply research or data • competency standards • contracts • copyright and privacy laws relating to physical materials and electronic technology • licensing • plagiarism • privacy • relevant commonwealth, state and territory legislation, policy, codes of practice and national standards • security of information.
Research findings may include:	• circulating publications for comment and critique on the internet • contributing to strategic policy • drafting publications or reports • presentations at seminars and conferences • providing data, plans, specifications and reports resulting in changed work practice/s or design/s • providing internal reports verbally, in writing or via presentations • publishing papers and articles for expert review and audiences • publishing reports and articles for lay audiences.

Unit Sector(s)

Unit sector	Telecommunications
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Sustainability
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