



Australian Government

PSPSCI503A Develop and undertake scientific/technological research

Revision Number: 3

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Modification History

Release	TP Version	Comments
3	PSP12V1	Unit descriptor edited.
2	PSP04V4.2.	Layout adjusted. No changes to content.
1	PSP04V4.1	Primary release.

Unit Descriptor

This unit covers the conduct of scientific/technological research at a broadly recognised level where considerable initiative and independent judgment are used within generally directed strategic programs. It includes framing the research question, developing the research methodology, undertaking and managing the research and disseminating the results. In practice, developing and undertaking scientific/technological research overlaps with other generalist or specialist work activities such as acting ethically, providing leadership, coordinating resources, gathering and analysing information, working safely. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency. Together, performance criteria specify the requirements for competent performance. Text in ***bold italics*** is explained in the Range Statement following.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Frame research question	1.1 Industry experience, industry analysis and consultation are used to identify viable research questions in accordance with organisational policy and procedures. 1.2 Consultation with possible funding bodies is undertaken to identify issues which may attract external funding. 1.3 Research question is framed to capture key issue/s, is clearly formulated and accompanied by supporting information. 1.4 Question to be researched is shown to be of benefit to the industry and relevant to the organisation's objectives and timeframes. 1.5 Issues relating to intellectual property are identified and managed in accordance with organisational requirements. 1.6 Research and professional networks are used to identify current information relevant to the research question, and both published and unpublished materials are assessed and analysed for relevant information.
2. Develop research methodology	2.1 Objectives are determined that represent logical and effective aspects of the question to be researched and meet organisational and funding requirements. 2.2 Research method/s and analytical techniques are analysed and the methodology and techniques selected are those that best enable objectives to be met in accordance with organisational policy and funding requirements. 2.3 Hypothesis is formulated and is plausible, relevant and of benefit. 2.4 Risk management strategies are determined and activities laid out methodically in accordance with the requirements of the research methodology. 2.5 Hypothesis, methodology, supporting information and activities are recorded in accordance with organisational and/or funding body requirements.
3. Undertake and manage research	3.1 Resources to conduct the research are attracted in accordance with organisational policy and procedures. 3.2 Tasks are scheduled, assigned and carried out in accordance with research methodology. 3.3 Research performance is monitored, data is analysed and interpreted and contingencies are dealt with in accordance with research requirements. 3.4 Research results are determined and documented in accordance with organisational requirements. 3.5 Research report/s are prepared within specified timeframes in

ELEMENT**PERFORMANCE CRITERIA**

accordance with organisational and/or funding body requirements.

3.6 Reports are written clearly and concisely in styles suited to scientific and/or lay audiences in accordance with organisational requirements.

4. Disseminate research results

4.1 Research results are ***disseminated*** within the organisation, to any external funding body, the scientific community and/or the industry via publications and presentations in accordance with organisational policy and procedures.

4.2 Intellectual property is protected in accordance with organisational and/or funding body requirements.

Required Skills and Knowledge

This section describes the essential skills and knowledge and their level, required for this unit.

Skill requirements

Look for evidence that confirms skills in:

- carrying out research
- using problem solving techniques
- working in and facilitating teams
- using technology for data input, analysis and preparation of reports
- interpreting and preparing reports containing scientific research information using a range of communication styles to suit different audiences and purposes
- responding to diversity, including gender and disability
- presenting research results tailored to different audiences such as regional industry/scientific audience
- applying occupational health and safety and environmental requirements to working in a scientific/technological research environment

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:

- research methodologies
- scientific process
- statistics (working knowledge)
- the use of sophisticated statistical models
- specialist area of expertise
- the industry
- possible sources of external funding
- reporting requirements for scientific research, requiring precision of expression and using a range of communication styles to suit different audiences and purposes
- legislation, public sector standards and organisational code of practice as they relate to work in a scientific research/technological environment
- public sector legislation including environmental and occupational health and safety requirements relating to scientific/technological research

Evidence Guide

The Evidence Guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the Unit descriptor, Performance Criteria, the Range Statement and the Assessment Guidelines for the Public Sector Training Package.

Units to be assessed together

- *Pre-requisite* units that must be achieved prior to this unit: *Nil*
- *Co-requisite* units that must be assessed with this unit: *Nil*
- *Co-assessed units* that may be assessed with this unit to increase the efficiency and realism of the assessment process include, but are not limited to:
 - PSPETHC501B Promote the values and ethos of public service
 - PSPGOV503B Coordinate resource allocation and usage
 - PSPGOV504B Undertake research and analysis
 - PSPGOV511A Provide leadership
 - PSPLEGN501B Promote compliance with legislation in the public sector
 - PSPOHS501A Monitor and maintain workplace safety

Overview of evidence requirements

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit
- application of the Employability Skills as they relate to this unit (see Employability Summaries in Qualifications Framework)
- scientific/technological research developed and undertaken in a range of (3 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- legislation, procedures, guidelines and protocols
- research guidelines and methodologies relating to scientific/technological research
- industry information
- risk management strategies relating to scientific/technological research
- case studies and workplace scenarios to capture a range of different research situations

Where and how to assess evidence

Valid assessment of this unit requires:

- a workplace environment or one that closely resembles normal work practice and replicates the range of conditions

likely to be encountered when developing and undertaking scientific/technological research, including coping with difficulties, irregularities and breakdowns in routine

- scientific/technological research developed and undertaken in a range of (3 or more) contexts (or occasions, over time)
- evidence of published research report/s and/or articles that merit peer recognition
- evidence of research presentation/s for statewide industry/scientific audience

Assessment methods should reflect workplace demands, such as literacy, and the needs of particular groups, such as:

- people with disabilities
- people from culturally and linguistically diverse backgrounds
- Aboriginal and Torres Strait Islander people
- women
- young people
- older people
- people in rural and remote locations

Assessment methods suitable for valid and reliable assessment of this competency may include, but are not limited to, a combination of 2 or more of:

- case studies
- demonstration
- observation
- portfolios
- projects
- questioning
- scenarios
- authenticated evidence from the workplace and/or training courses

For consistency of assessment

Evidence must be gathered over time in a range of contexts to ensure the person can achieve the unit outcome and apply the competency in different situations or environments

Range Statement

The Range Statement provides information about the context in which the unit of competency is carried out. The variables cater for differences between States and Territories and the Commonwealth, and between organisations and workplaces. They allow for different work requirements, work practices and knowledge. The Range Statement also provides a focus for assessment. It relates to the unit as a whole. Text in ***bold italics*** in the Performance Criteria is explained here.

Current information may include:

- other research in progress locally, nationally and internationally
- recently published information
- unpublished information

Research methods may include:

- single experiment
- chain of experiments

Analytical techniques may include:

- statistical analysis
- sample analysis

Resources may include:

- human
- physical
- monetary
- design specifications
- technical manuals
- componentry
- radioactive samples

Attraction of resources may include:

- from external source/s
- allocation from within the organisation

Documented may include:

- complete record to be held internally within the organisation
- preparation of research results for publication

Dissemination of results may include:

- gaining recognition through publishing and presenting research
- front author in externally refereed publications
- internal reporting verbally and in writing
- publishing material in industry journals
- publishing reports for scientific audiences
- publishing reports/articles for lay audiences
- presentations at seminars and scientific conferences

Unit Sector(s)

Not applicable.

Competency field

Government Science & Technology.