SKILLS IN ANZSCO - OPTIONS PAPER

Changes to the concept and measurement of skill in the Australian and New Zealand Standard Classification of Occupations to better reflect the contemporary Australian labour market
June 2022

Contents

1 INTRODUCTION

The Australian and New Zealand Standard Classification of Occupations (ANZSCO) provides the basis for standardised collection, analysis and dissemination of occupation data for Australia. It is an integrated framework for storing, organising and reporting occupation-related information in both statistical and other analytical applications. ANZSCO is used in the Census of Population and Housing, the Labour Force Surveys (LFS), and other ABS surveys to measure and understand the Australian labour market.

ANZSCO is a skill-based classification. It was first published in 2006 with a (then) contemporary concept and measurement of skill. ANZSCO will remain a skill-based classification to support international comparability.[1] This supports important analysis of Australia's labour market with respect to other labour markets. However, feedback from key users of the classification is that the way in which skills are reflected in ANZSCO needs to change to reflect how skills are used in the contemporary Australian labour market.

This paper describes the concept and measurement of skill within ANZSCO. It then outlines six key areas of concern with how skill is currently reflected in ANZSCO due to developments in how key stakeholders in Australia now define and measure skill. These six areas of concern have been identified by stakeholders and users of ANZSCO via targeted consultation undertaken by the ABS and in response to the publication of the Skills Problem Statement[2] in March 2022. This paper then presents six proposed options to address these areas of concern and provide a contemporary representation of skill in ANZSCO. The ABS is seeking feedback on these options to ensure they address the key areas of concern and are supported by users of the classification.

2 THE CONCEPT AND MEASUREMENT OF SKILL

The concept of skill is interpreted and applied in different ways depending on its use within an organisation or industry. It is often used interchangeably with terms such as:

- general competencies, or "employability skills", such as teamwork or communication,
- the knowledge, qualification, and experience required to perform a job, or which is used in an occupation,
- the competencies needed to undertake tasks related to a job by outlining sought after skills in job advertisements, and
- a particular set of skills gained upon course completion when specifying training outcomes.

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[1] The International Standard Classification of Occupations, 2006 (https://www.ilo.org/public/english/bureau/stat/isco/) is an international skill-based classification of occupations. ANZSCO needs to align with this classification to maintain international comparability.
[2] https://consult.abs.gov.au/standards-and-classifications/updating-the-australian-and-new-zealand-standard-c/supporting_documents/Paper_Skills%20Problem%20Statement.pdf. This contained five areas of concern. A sixth area of concern has been added as a result of subsequent consultation.

Skill is difficult to measure and generally referenced in a broad sense. Most measurements of skill make some level of approximation, as direct measures are difficult to obtain. Common metrics used to measure skills include qualification level, field of study or occupation.[3]

2.1 SKILL WITHIN ANZSCO

Skill as reflected in ANZSCO determines the structure of this classification. It is the criterion which distinguishes the first occupation (Chief Executive Officer in Major Group 1 - Managers) from the last occupation (Trolley Collector in Major Group 8 - Labourers). The range of tasks and skills required to undertake the role of a Chief Executive Officer are fundamentally different from those undertaken by a Trolley Collector.

Skill refers to "the ability to competently perform the tasks associated with an occupation" and is measured by considering skill level and skill specialisation. Each occupation is defined as a set of jobs that require the performance of similar or identical sets of tasks. It is the criteria which determines the set of jobs aggregated into an occupation, and which occupations are combined within the same Major Group. By way of example, the Trolley Collector occupation combines jobs collecting trolleys by hand with those collecting trolleys by trailer. Skill is why the Trolley Collector and Handyperson occupations are both in Major Group 8 – Labourers. The Chief Executive Officer occupation is in Major Group 1 – Managers as its tasks are dis-similar or unlike those undertaken by a Trolley Collector and Handyperson.

Skill level is defined in ANZSCO as a "function of the range and complexity of the set of tasks performed in an occupation. The greater the range and complexity of the set of tasks, the greater the skill level of an occupation."[4] It is measured by evaluating three elements required to competently perform the set of tasks required of an occupation:

- *the level or amount of formal education and training* – this refers to the level and amount of education and training required for competent performance of the tasks undertaken in an occupation. In Australia, this is measured in terms of educational qualifications as set out in the Australian Qualifications Framework.[5]
- *the amount of previous experience in a related occupation* – this refers to the time spent gaining work experience in related occupations or activities required to competently perform the tasks undertaken in an occupation.
- *the amount of on-the-job training* – this refers to the amount of training required after commencing a role to perform competently. It is measured in months or years and may be undertaken at the same time as formal training.

Skill level is centred around an occupation, not the individual undertaking an occupation, and does not represent a judgement of the societal or economic value of an occupation. There are five skill levels within ANZSCO, and the majority of occupations are assigned only one skill level. The

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[3] OECD (2018), *Getting Skills Right: Australia*, Getting Skills Right, OECD Publishing, Paris, https://doi.org/10.1787/9789264303539-en.
[4] Conceptual basis of ANZSCO | Australian Bureau of Statistics (abs.gov.au)
[5] Home | AQF

assignment of skill level to an occupation is based on advice from employers, industry training bodies and professional organisations.

Skill specialisation is defined as a function of the following:

- *field of knowledge required* – this refers to the subject matter knowledge that is essential to undertake the tasks associated with an occupation competently.
- *tools and equipment used* – this refers to all forms of plant, machinery, computer-based equipment, or hand tools used to undertake the tasks associated with an occupation. This includes intellectual tools and art or design techniques.
- *materials worked on* – this refers to both tangible and abstract materials in nature which are extracted, processed, transformed, refined, or fabricated as an essential part of the tasks performed in an occupation.
- *goods and services produced or provided* – this refers to the end product of the performance of the task of an occupation and includes physical goods, personal or other services, or products such as a software application or statistical information.

In ANZSCO, occupations are grouped together based on their skill level and skill specialisation. Skill level and skill specialisation are used to structure eight Major Groups that are both useful and meaningful (Table 1).

Table 1: The relationship between skill level and skill specialisation and ANZSCO Major Groups[6]

Major group	Predominant skill levels
1 – Managers	1 and 2
2 – Professionals	1
3 – Technicians and Trade Workers	2 and 3
4 – Community and Personal Service Workers	2, 3, 4 and 5
5 – Clerical and Administrative Workers	2, 3, 4 and 5
6 – Sales Workers	3, 4 and 5
7 – Machinery Operators and Drivers	4
8 – Labourers	4 and 5

2.2 SKILL WITHIN THE AUSTRALIAN QUALIFICATIONS FRAMEWORK

The Australian Qualifications Framework (AQF) is a comprehensive national qualification framework that incorporates qualifications issued by education and training institutions. It is the national policy for regulated qualifications in Australian education and training.[7] The AQF classifies regulated qualifications based on their relative complexity.[8] The AQF is a 10-level taxonomy of knowledge, skills, and the application of these, that summarises what graduates are expected to know, understand and be able to do as a result of learning. Skill is one aspect considered in the framework,

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[6] How ANZSCO works | Australian Bureau of Statistics (abs.gov.au)
[7] Home | AQF
[8] Home | AQF

and is defined as what a graduate can do, described in terms of the kinds and complexity of skills, including cognitive and creative skills, technical skills, communication skills and interpersonal and generic skills.[9] The AQF informs the assignment of skill level to occupations in ANZSCO as noted earlier.

2.3 SKILL WITHIN THE AUSTRALIAN SKILLS CLASSIFICATION

The Australian Skills Classification (ASC) complements ANZSCO and is used to describe the core competencies, specialist tasks and technologies that are required to undertake a subset of occupations in Australia.[10] The ASC seeks to provide a common language to describe skills, enabling stakeholders to identify and articulate skills using a comprehensive and universal taxonomy. It does not consider several aspects of the criteria considered by ANZSCO (e.g. those associated with skill level).

The ASC contains three elements:

- *core competencies / employability skills* – these are common to all occupations, such as teamwork, writing, problem solving and planning and organising. A subset of these correspond with the tasks associated with an occupation in ANZSCO. The majority of the ASC's core competencies are not reflected in ANZSCO as employability skills are not included in its classification criteria.
- *specialist tasks* – these are the work activities a person undertakes specific to an occupation. These correspond with the tasks associated with an occupation in ANZSCO which are not considered "core competencies" or "technology tools".
- *technology tools* – these are the hardware and software technologies required to be used in undertaking an occupation.[11] The ASC's "technology tools" overlap with "tools and equipment used" in defining skill specialisation in ANZSCO.

3 KEY AREAS OF CONCERN WITH ANZSCO'S 2006 CONCEPT AND MEASUREMENT OF SKILL

There are six key areas of concern regarding ANZSCO's 2006 concept and measurement of skill. They have been identified by stakeholders and users of ANZSCO via targeted consultation undertaken by the ABS and in response to the publication of the Skills Problem Statement in March 2022. These areas of concern, alongside six proposals to address them are outlined in this section.

3.1 ANZSCO'S SKILL LEVEL DOES NOT REFLECT THE CONTEMPORARY AUSTRALIAN LABOUR MARKET

This area of concern relates to where the AQF regulated qualification or quantity of relevant experience required to competently perform an occupation's set of tasks have changed since 2006

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[9] page 11, https://www.aqf.edu.au/publication/aqf-second-edition
[10] Australian Skills Classification | National Skills Commission. The ASC currently covers the majority of, but not all, occupations in ANZSCO. The National Skills Commission intends to expand its coverage of occupations in ANZSCO over the coming years.
[11] National Skills Commission Annual Report 2020-2021

(and ANZSCO has not). For example, ANZSCO currently states an AQF Certificate II or III, or at least one year of relevant experience is required to competently perform a Linemarker's (occupation 721912) tasks. On this basis, a Linemarker was assigned skill level 4 when ANZSCO was first published in 2006. ANZSCO has not reviewed whether this qualification or experience requirement (and thus skill level) still applies in the contemporary Australian labour market. A Linemarker should be assigned skill level 5 (if a Linemarker's tasks can be competently performed in the contemporary Australian labour market with no qualification and no relevant experience[12]) or skill level 3 (if an AQF Certificate IV[13] is required in the contemporary Australian labour market).

PROPOSAL 1 – UNDERTAKE MORE FREQUENT REVIEWS OF ANZSCO'S OCCUPATIONS

More frequent reviews of ANZSCO's [1,070] occupations through an ongoing maintenance strategy will partially address this area of concern. The ABS reviewed approximately ten percent of ANZSCO's 1,070 occupations during 2021 and received funding in the 2022/23 budget to "ensure that Australia's classification of occupations and labour market statistics reflect the current and future labour market".[14] This will enable the ABS to complete a comprehensive review of the classification by December 2024 and reflect the contemporary Australian labour market in time for the 2026 Census of Population and Housing.

Following the comprehensive update, the ABS will commence an ongoing program of work to maintain ANZSCO in accordance with the approach outlined in the Maintenance Strategy Information Paper *(refer **Related** section of the ANZSCO consultation)*.

Reviews of ANZSCO's occupations may impact time series where an occupation's skill level is modified. This occurs as employed persons classified to this occupation "move" across Unit Groups. [15] [16] Under the proposed maintenance strategy, the extent to which time series data is impacted will determine whether the change is considered minor for annual release or major to be held and released in the final year of a five year review cycle, in time for the next Census of Population and Housing.

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[12] https://www.yourcareer.gov.au/careers/721912/linemarker

[13] https://training.gov.au/Training/Details/RII40720

[14] https://www.abs.gov.au/media-centre/media-releases/update-australian-bureau-statistics-work-program

[15] Unit Groups are the smallest groups of occupations within ANZSCO and the most detailed level published in many official statistics. If occupations are assigned a new skill level, employed persons must "move" as Unit Groups have a single skill level. For example, if a Linemarker was assigned skill level 5 from January 2022, all Linemarkers would "move" from Other Mobile Plant Operators (Unit Group 7219) to Other Miscellaneous Labourers (Unit Group 8999). The change would take effect from when the qualification or experience required changed, for example January 2022. In the absence of any other changes, employed persons in Major Group 7 would decrease and employed persons in Major Group 8 would increase between December 2021 and January 2022.

[16] The impact on time series is ambiguous when an occupation, and therefore Unit Group, has multiple skill levels. By way of example, Aged or Disabled Carer (occupation 423111) has been assigned skill level 4 occupation, but "some roles" are at skill level 3. This will be addressed by a comprehensive review of the classification by December 2024.

3.2 MICRO-CREDENTIALS AND OTHER TRAINING OUTSIDE THE AQF ARE NOT ADEQUATELY REFLECTED IN ANZSCO

AlphaBeta (2019) predicted that most new learning (to obtain skills), particularly post-initial qualification, will occur through short courses and on-the-job training focusing on skill requirements. This report emphasises the importance of collecting information on this form of learning.[17] At this stage, there is little available data that comprehensively captures and reports on shorter form credentials such as micro-credentials.[18]

Stakeholders have indicated the contemporary Australian labour market also values:

- skills obtained outside of the workforce, for example, through volunteering or family duties are also considered relevant in the contemporary Australian labour market,
- training provided outside the Australian education system, for example, an occupation specific certification issued by an overseas organisation, and
- on the job training which is not accompanied by a formal certification or measured via years of experience.

The current measurement of skill level in ANZSCO considers only regulated qualifications described by the AQF. The AQF (and therefore ANZSCO) does not provide comprehensive coverage of all micro-credentials or address the other three listed sets of skills and training described above. The AQF provides a mechanism to recognise prior learning which equates existing micro-credentials, skills and training with a proportion of an AQF qualification. This process is undertaken on a case-by-case basis. The cost to undertake this process for all micro-credentials and other training outside the AQF is prohibitive.

The ABS welcomes suggestions to address this area of concern.

3.3 USE OF NON-UNIFORM LANGUAGE AND INCONSISTENT TERMINOLOGY

Each of ANZSCO's 1,070 occupations should be described by a set of tasks which uniquely define an occupation. By way of example, the task "installing, testing and adjusting electric and mechanical parts of lifts" is unique to the Lift Mechanic (occupation 341113). This task is not performed by any other occupation.

ANZSCO does not describe a set of tasks for each of its 1,070 occupations. The set of tasks is currently defined for the Unit Group. For example, the Lift Mechanic is aggregated with the Electrician in Unit Group 3411 (Electricians). This Unit Group is defined by nine tasks (of which the aforementioned task is one). Stakeholders are required to determine the relationship between the Unit Group's nine tasks and the underlying occupations.

The ASC is maintained by the National Skills Commission and defines a set of skills for a subset of ANZSCO's 1,070 occupations. One skill assigned to a Lift Mechanic is "Install electrical components, equipment or systems." This skill is not unique to a Lift Mechanic (i.e. it is common to all occupations

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[17] google-skills-report.pdf (alphabeta.com)
[18] Review of the Australian Qualifications Framework Final Report 2019 - Department of Education, Skills and Employment, Australian Government (dese.gov.au)

in Unit Group 3411 as well as other occupations outside this Unit Group). The ASC's description and the ANZSCO task wording are similar, but not identical.

PROPOSAL 2 – ENSURE ALL OCCUPATIONS IN ANZSCO CONTAIN A UNIQUE SET OF TASKS AND IMPROVE CONSISTENCY OF LANGUAGE

This proposal entails listing the unique set of tasks which describe each of ANZSCO's 1,070 occupations. This would be achieved by assigning the tasks currently recorded against each Unit Group to the relevant occupations within that Unit Group. It would also involve providing additional (occupation specific) detail. This detail would be developed in partnership with relevant subject matter experts.

This proposal will improve the consistency of language more broadly throughout ANZSCO. It will ensure that where the same tasks and duties are undertaken by different occupations, consistent language is used.

This proposal would not impact time series.

PROPOSAL 3 – EXPLORE SOLUTIONS TO DIRECTLY LINK BETWEEN EACH OCCUPATION IN ANZSCO AND ITS ASC SKILLS

This proposal would explore solutions to enable users to directly link from an occupation as described in ANZSCO to its corresponding skills as outlined in the ASC. The relationship between an occupation in ANZSCO and its ASC skills is maintained by the National Skills Commission.

This proposal would not impact time series.

3.4 ANZSCO DOES NOT SUPPORT IDENTIFICATION OF JOB PATHWAYS OR MOBILITY ACROSS OCCUPATIONS

ANZSCO's occupation groups are skill-based. They are not based on job pathways. For example, many employed persons are likely to progress on the pathway from an Aquaculture Worker (occupation 842111) to an Aquaculture Supervisor (occupation 363111). ANZSCO places these occupations in different Major Groups as they require a different skill level and skill specialisation. ANZSCO is not designed to identify job pathways or mobility across occupations. The information held in the ASC may assist with this analysis.

The ABS has produced alternative views of ANZSCO to assist with understanding the occupations comprising a labour force of interest. Examples include the Agriculture, Health, and Culture and Leisure.[19] This is a non-standard product and is costly to maintain. The ABS received funding in the 2021/22 budget to design a solution to enable users to build their own view of ANZSCO and to save it for others to use. The required design and cost-benefit analysis will be finalised by the end of

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[19] 1220.0 - ANZSCO - Australian and New Zealand Standard Classification of Occupations, First Edition, Revision 1 (abs.gov.au)

2022. This solution could assist users to understand the different job pathways in the Australian labour market.

Mobility across occupations would also be supported by the work included in Proposal 2 to improve the consistency of the use of language used by ANZSCO when describing the same tasks and duties.

PROPOSAL 4 – ENABLE CUSTOMISED VIEWS OF OCCUPATIONS IN ANZSCO TO SUPPORT "JOB PATHWAY ANALYSIS"

This proposal would include a "job pathway analysis" use case in the design work underway to enable users to take customised views of ANZSCO. Another possible view enabled by this solution is assigning all of ANZSCO's 1,070 occupations to an industry division or sub-division as defined by the Australian and New Zealand Industrial Classification (ANZSIC). This would enable users to combine Aquaculture Workers and Aquaculture Supervisors within the same group as both occupations are common to the Agriculture, Forestry and Fishing division within ANZSIC.

This proposal would not impact time series as ANZSCO would remain a skill-based classification.

3.5 SKILL LEVEL AND SPECIALISATION DO NOT REFLECT COMPETENCY

ANZSCO currently excludes "employability skills", or "personal attributes" and "generic skills"[20] on the basis that they relate to the individual, rather than an occupation. ANZSCO also notes generic skills, such as communication, problem-solving and self-management, have limited value as criteria when forming groups of occupations because they are applicable to most occupations.

Stakeholders raised concerns that these skills have become increasingly significant within the contemporary Australian labour market. An example is the establishment of new frameworks since 2006, such as Human Factors.[21] It was suggested these skills, and "employability skills" more generally, were significant within the contemporary Australian labour market and should therefore be considered by ANZSCO.

PROPOSAL 5 – CLARIFY THE EXISTING TREATMENT OF EMPLOYABILITY SKILLS WITHIN ANZSCO

This proposal would clarify the existing treatment of employability skills[22] to emphasise their significance and reference new frameworks, such as Human Factors. It will also note employability skills are considered by the ASC (see Proposal 3)

This proposal would not impact time series as employability skills have limited value as criteria when forming groups of occupations because they are applicable to most occupations.

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[20] 1220.0 - ANZSCO - Australian and New Zealand Standard Classification of Occupations, First Edition, Revision 1 (abs.gov.au)
[21] Human Factors Learning Day 2020 - Clinical Excellence Commission (nsw.gov.au)
[22] Conceptual basis of ANZSCO | Australian Bureau of Statistics (abs.gov.au)

3.6 "SKILL LEVEL" AND "SKILL SPECIALISATION" CAN BE MISLEADING

The term "skill" is used in multiple instances within ANZSCO. Examples include "skill-based classification", "skill level", and "skill specialisation". While these have been defined in ANZSCO, the repeated appearance of the term "skill" has created confusion among several ANZSCO users. The significance of this issue expands when the multiple usages outside ANZSCO such as "Australian Skills Classification", and "skill" within the AQF are also considered.

PROPOSAL 6 – USE ALTERNATE TERMS FOR "SKILL LEVEL" AND "SKILL SPECIALISATION"

Alternate terms for "skill level" and "skill specialisation" would be developed under this proposal. The alternate terms would be synonyms and make no change to the underlying concepts.

This proposal would not impact time series.

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4   IMPLEMENTING THE SIX PROPOSALS

The six proposals described in this paper are summarised in Table 2 (below) along with the expected consequences of implementation. These proposals comprise the set of changes which could address the key areas of concern raised by stakeholders. The priority of a given proposal is informed by the relationship between the expected benefit and the consequences of implementation.

The ABS suggests three criteria should be considered when assessing the consequences of implementation for each proposal, namely:

- *Consistency with international reporting*: This criterion considers the degree to which statistics produced using ANZSCO are consistent with international standards, and therefore support international reporting. The International Standard Classification of Occupations is the international standard for occupation statistics. Its occupation groups are skill-based, and ANZSCO is currently broadly consistent with the international standard, enabling global comparability.
- *Impact upon time series*: This criterion considers whether existing time series will be consistent, or whether there will be a break in the time series. Breaks in time series hinder the ability to understand trends or patterns over time or require significant resources to revise the existing time series to use the new classification.
- *Implementation cost:* This criterion considers the cost of implementation for both the ABS and stakeholders. The benefits of a change will need to outweigh the cost – this is not a cost incurred by the ABS alone.

Table 2: Six proposals to address key areas of concern identified by ANZSCO stakeholders

	Proposal	Area of concern						Consequences of Implementation			Expected Benefit	Priority
		1	2	3	4	5	6	Consistency with international reporting	Impact upon time series	Implementation cost		
1	Undertake more frequent reviews of ANZSCO's occupations	Y						High	Medium (ongoing)	High (ongoing)	Significant	High
2	Ensure all occupations in ANZSCO contain a unique set of tasks and improve consistency of language			Y	Y			High	Nil	High (one off)	Moderate	High
3	Explore solutions to directly link between each occupation in ANZSCO and its ASC skills			Y	Y	Y		High	Nil	Medium (ongoing)	Significant	High
4	Enable customised views of occupations in ANZSCO to support "job pathway analysis"				Y			High	Nil	Medium	Moderate	Medium
5	Clarify the existing treatment of employability skills within ANZSCO					Y		High	Nil	Low	Minimal	Medium
6	Use alternate terms for "skill level" and "skill specialisation"						Y	High	Nil	Low	Minimal	Medium

5   CONCLUSION

This paper has described the concept and measurement of skill within ANZSCO and outlined six proposals to address key areas of concern identified by stakeholders with how skills are currently reflected in ANZSCO. These proposals are options to provide a contemporary representation of skill within ANZSCO. The consequences of implementing these options include consistency with international reporting, impact upon time series, and the implementation cost. The priority of each proposed option is informed by the relationship between the expected benefit and the consequences of implementation.

The ABS is seeking feedback on these proposed options to ensure they address the key areas of concern and are supported by users of the classification. We would appreciate you taking the time to answer the questions posted on the ABS Consultation Hub. If you have any queries regarding the content of this paper and the update model proposed, please contact us by emailing anzsco.maintenance@abs.gov.au

Once responses have been received, the ABS will determine which of these proposed options will be implemented over time and publish this position later in 2022. This will include the intended timeline for implementation.

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