Australian Government

Jobs and Skills Australia

National Skills Taxonomy Discussion Paper

To inform the design of a National Skills Taxonomy

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Introduction

Jobs and Skills Australia (JSA) is working to develop a National Skills Taxonomy (NST).

The Australian Universities Accord identified an NST as crucial for creating a joined-up tertiary education system that enhances occupational mobility and supports lifelong learning. An NST could improve Australia's ability to identify and navigate the rapidly changing skills landscape by establishing a common language for employers, education institutions, government, and individuals regarding skills and certifications. This language must reflect the broad range of skills an occupation requires.

Skills development is the backbone of the economy, empowering individuals to transition between jobs and industries, drive productivity and fill skills gaps.

By connecting stakeholders through a common skills taxonomy, we can create a cohesive approach to workforce development that enhances occupational mobility and aligns workforce capabilities with industry needs. The Australian Skills Classification (ASC) provides a strong first step, but limitations hold it back. A decision has been made to decommission the ASC and replace it with an NST. An NST could help identify and address emerging skills needs, enhance training and education efforts, and ultimately support economic growth by ensuring a well-prepared and adaptable workforce while ensuring occupational licencing and workplace health and safety skills are thoroughly considered.

Broad stakeholder engagement will guide JSA in setting its policy direction.

To inform the design and development of an NST, JSA is consulting with a wide range of stakeholders, including individuals, unions, employers, tertiary education providers, and governments. The purpose of this consultation is to better understand the role the taxonomy can play, how future users might interact with it, the design and features required to deliver on stakeholder ambitions and considerations for ongoing governance and maintenance.

JSA has recently conducted a consultation process to understand the experiences of a broad range of users of the ASC. Insights from the ASC consultation process will also inform the development and structure of the NST. The NST will incorporate lessons learned about the use cases, strengths, limitations, and critical features of the ASC before it is decommissioned and replaced by the NST.

This Discussion Paper provides background information and invites stakeholders to consider the critical aspects of the NST and contribute to its development.

This paper serves as background for JSA's consultations, offering context and key discussion questions to help surface valuable stakeholder insights. It details:

- *Section 1:* Case for change, including the context in which the NST is being developed
- *Section 2*: Potential use cases, vision and principles for the NST
- *Section 3:* Considerations for the design, development and implementation of an NST
- *Section 4:* Next steps for stakeholders and JSA following this consultation.

Definitions

This discussion paper is to inform consultations on the development of the NST. The following definitions are provided as context for this paper rather than for formal comment. The intent of this consultation is to inform the final design and remit for an NST.

National

The final design is intended for use across all Australian jurisdictions and potentially beyond.

Skills

A common skills definition has been difficult to achieve both nationally and internationally. Each industry, institution, workplace and worker has their own language to describe what they do and how they do it, resulting in multiple different definitions for the term Skills.

It is intended that this consultation will help move towards a common definition while accounting for the different view of stakeholders and the nature of skills.

This paper does not seek to pre-empt the views of stakeholders with a definition. However, common elements underpin definitions applied across the world. In this context, skills:

- are grounded in conscious action
- have relevance to work and learning.
- take many forms
- can be developed.

Selected definitions for skills are provided in Appendix B.

Taxonomy

The primary purpose of an NST is as a data taxonomy, a hierarchical structure separating data into specific classes based on common characteristics. Data taxonomies:

- Follow a hierarchical format and provide names for each object in relation to other objects
- Have specific rules used to classify or categorize any object in a domain. These rules must be complete, consistent, and unambiguous
- Apply rigor in specification, ensuring any newly discovered object must fit into one and only one category or object
- Inherit all the properties of the class above it, and can also have additional properties
- May also capture the membership properties of each object in relation to other objects. [1]

[1] https://data.nsw.gov.au/IDMF/data-structure-and-coordination/data-taxonomy

1. A National Skills Taxonomy aims to enable a flexible and responsive skills system

Skills are at the centre of Australia's education system and labour market. Despite the importance of skills, challenges persist in responding to needs. An NST could help actors to align in a collective response.

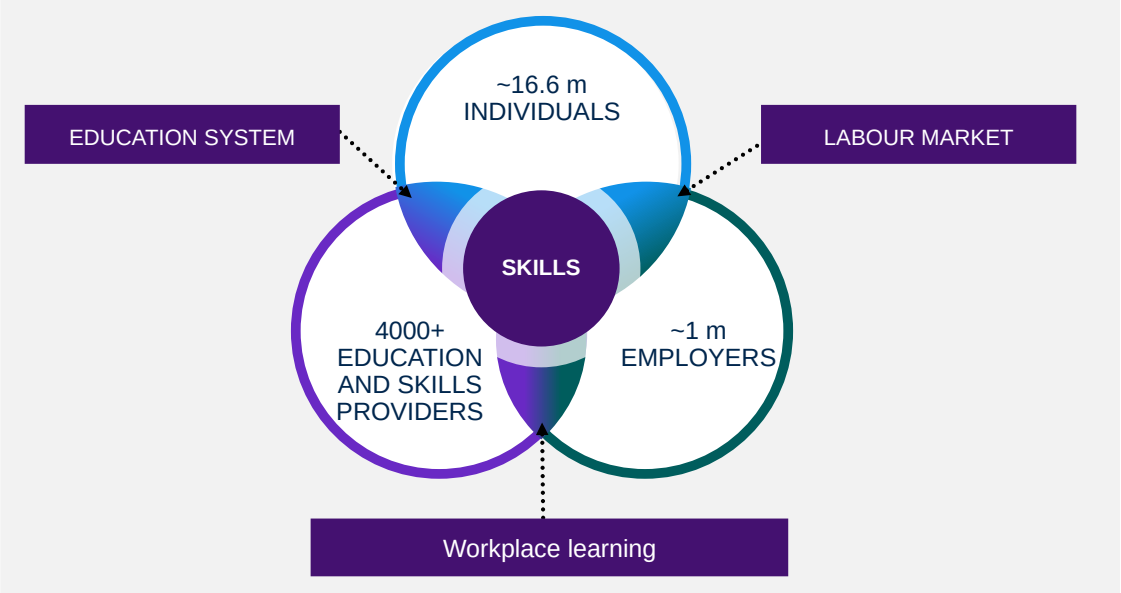
1.1 Skills are at the centre of Australia's education system and labour market

Individuals, businesses, and communities thrive when they collectively have the skills to productively participate in education, employment and the economy. This includes the right skills to support individuals to engage in safe, secure, fairly paid work, and to update and refresh their skills to support transition between jobs and industries over their career. At the same time, the evolving population of skilled workers ensures business can function productively and profitably.

In this context skills are the critical connective tissue of Australia's education system and labour market, bridging the gap between education, employment, and economic productivity. As illustrated in Figure 1, skills are at the centre of three constantly evolving systems: the education system, the labour market, and professional development. Skills are the critical link between ~16.6 million working age individuals,[2] ~1 million employers,[3] and over 4,000 education and skills providers[4,5]. By placing skills at the forefront, we can improve the understanding and respond to the dynamic needs of these interconnected systems.

[2] Australian Bureau of Statistics, 2023. 'Potential workers'.
[3] Australian Bureau of Statistics, 2023. 'Counts of Australian businesses, including entries and exits'.
[4] Education and skills providers include Universities, TAFEs, Non-University Higher Education Providers, Non-TAFE RTOs and other non-accredited providers of education and training services.
[5] Parliament of Australia, 2020. 'The vocational education and training sector: a quick guide'.

Figure 1: Skills and their relationship to education and employment



1.2 Despite the importance of skills, challenges persist in responding to needs

Australia's labour market is under strain. A period of unprecedented growth has resulted in record levels of participation and low unemployment. However, this has not come without challenges. Occupational shortages are entrenched and growing while productivity remains flat, with productivity growth over the decade to 2020 the slowest in 60 years.[6]

Operating at this level of employment requires a system that is sufficiently agile and responsive to adapt quickly and efficiently to changing skill and labour needs as opportunities to meet need through increased participation. To achieve this, individuals, unions, employers, and educators must all be aligned in their understanding of what is needed, in what quantities, and when. This can be challenging to achieve.

These challenges are not unique to Australia and are being experienced by most countries globally. In response, countries are investing in national skills taxonomies to help identify and respond to current and emerging skills needs. UK, Canada, Malaysia and Indonesia are just some examples joining more established systems in the US, Singapore and Europe.

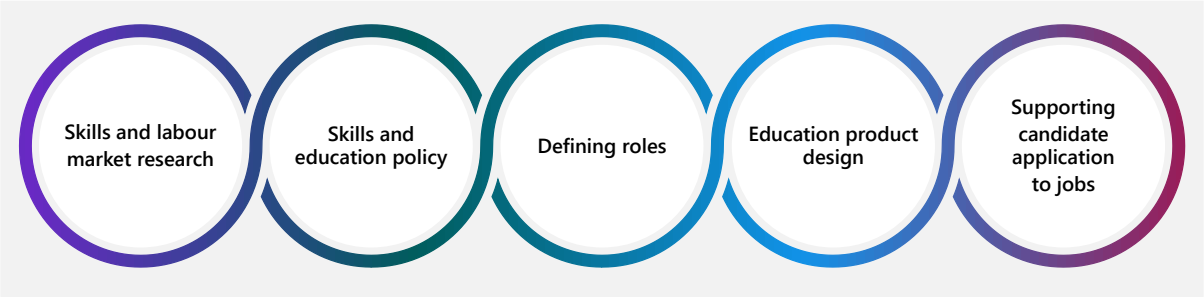
While a range of skills taxonomies and frameworks exist in Australia, there is no single framework or taxonomy that consistently describes the range of skills employers and individuals need across the Australian labour market and education system.

The ASC is the closest to meeting needs, but key limitations hold it back. Skills are defined at uneven levels of detail, which means it is better suited to some use cases than others. In particular, its strong alignment to ANZSCO and competency-based skills definitions make it challenging to apply in education contexts. This combined with the limited awareness of the ASC prevents it from operating as a true shared language across contexts. These limitations mean that while the ASC has provided significant value in a wide range of specific use cases, it has not seen the systemic implementation that would be required to achieve the

[6] Commonwealth Treasury, 2023.

collective aspirations of stakeholders for an NST. The most common use cases for the ASC are outlined in Figure 2 below.

Figure 2: Common ASC use cases



Instead, education institutions, private firms, professional associations, unions and governments maintain their own frameworks and terminology for skills. Some frameworks have specific and granular definitions of skills, whereas others use broad terminology. It is the equivalent of each actor speaking a different language.[7]

This fragmentation creates significant translation barriers leading to siloed approaches and inefficiencies in addressing skills mismatches and gaps.

This can appear as:

- Skills shortages in critical occupations and roles.
- Slow adoption of new or emerging technology and practices.
- Employers unable to identify which individuals have the right skills.
- Individuals lacking the right mix of skills for available jobs.
- Disjointed career and educational pathways for individuals.
- Underinvestment by businesses and individuals in professional development and lifelong learning.
- Individuals not adequately prepared for transitions into further education or employment.

For these reasons and others, the Australian Universities Accord called on JSA to continue the development and use of an NST across the tertiary education system.[8] While an NST is not a solution to the above challenges in its own right, the development of the NST is seen to assist in the connection of a joined up tertiary system, recognising the importance of closer collaboration between vocational education and training (VET) and higher education for Australia's skills formation. The NST also provides the opportunity to assist in the potential development of the National Skills Passport and as an important enabler for the Australian Tertiary Education Commission (ATEC). The NST could also support ongoing discussions relating to the AQF as set out in the Noonan Review (2019).

Better alignment between the two sectors would enable the delivery of quality education and training that meets the needs of students and develops the skills needed by industry.

[7] 'Actors' are those directly involved in a process, while 'stakeholders' are those with an interest in the outcomes, regardless of direct involvement.
[8] Australian Government, Australian Universities Accord: Final Report, 2023.

1.3 A National Skills Taxonomy could help actors to align in a collective response

A skills taxonomy is the practice of organising skills into distinct categories or clusters based on their definition. Skills taxonomies can vary in their detail, structure, and definitions. The features of a skills taxonomy are dependent on their intended use cases.

Disparate and disconnected ways of understanding skills is a problem in the face of a changing jobs and skills landscape. A skills taxonomy seeks to categorise and organise the various skills to provide a common language for workers, employers, training providers, and educators.

By systematically laying out the skills that underpin Australia's workforce, a National Skills Taxonomy provides a bridge across the other three foundational taxonomies - occupation, qualification and industry. The enhanced understanding this enables contributes to a more dynamic and responsive skills ecosystem that can better meet the demands of rapidly changing communities and economies within the limits of existing licensing and regulatory frameworks.

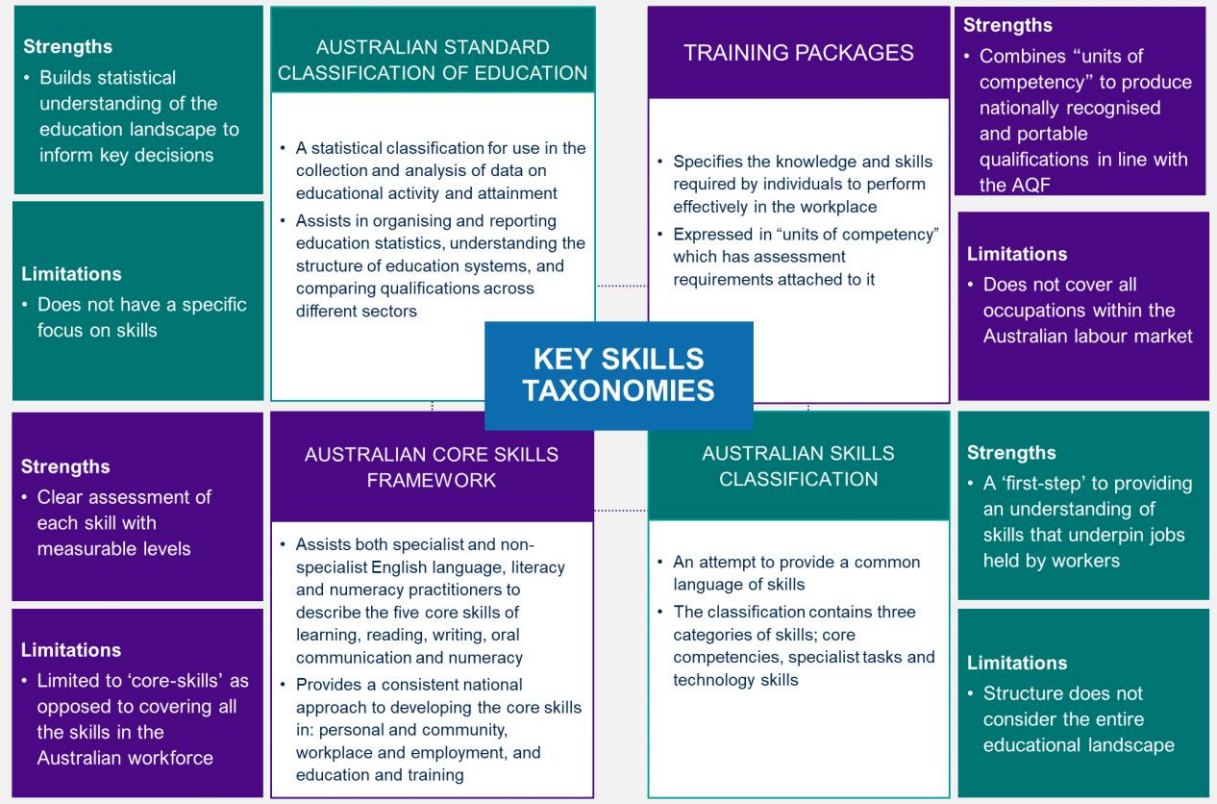
In Australia, the taxonomies for occupation, qualification and industry are relatively well established in the form of the Australia and New Zealand Standard Classification of Occupations (ANZSCO), Australian Qualifications Framework (AQF) and Australia and New Zealand Standard Industrial Classification (ANZSIC). While concerns about the currency of some of these taxonomies exist, such as the absence of emerging occupations in ANZSCO to quickly respond to emerging roles, changes to these taxonomies are beyond the scope of this consultation.

In contrast, there are a broad range of other taxonomies in the skills space. The key skills taxonomies are: the Australian Standard Classification of Education (ASCED); Training Packages; the Australian Core Skills Framework (ACSF), and; the Australian Skills Classification (ASC). A summary of these classifications is provided in Figure ***3***3.

A range of other frameworks and taxonomies are also used to varying degrees across the economy. Common examples include:

- International frameworks including the Occupational Information Network (O*NET), European Skills, Competences, Qualifications and Occupations (ESCO) and Singapore Skills Frameworks.
- Industry and employer-based frameworks such as the Skills Framework for the Information Age (SFIA) and the Australian Signals Directorate (ASD) Cyber Skills Framework.
- Other education curriculums e.g. the Australian Curriculum.
- Taxonomies from private companies such as Lightcast or LinkedIn.

Figure 3: Key Australian skills taxonomies



Some skills frameworks focus more heavily on foundation, core, transversal or employability skills than day-to-day job tasks. Skills are also articulated differently across the VET and higher education systems. While there is some crossover between the occupations whose skills are taught in these systems, not all occupations are covered by just one.

Beyond Australia, there is also a role for an NST to promote skills collaboration regionally and globally through interoperability between a new taxonomy and comparable taxonomies in other countries. Australia's development of the ASC has already positioned Australia as a leader in this field, despite some of its limitations.

It is clear while there is an opportunity for an NST it is also a contested space. A well designed NST could help build upon and align existing taxonomies and frameworks, but a poorly designed NST could result in unintended consequences, e.g. industrial implications. This risk should be front of mind as potential use cases and the detailed design of an NST are considered. Further considerations are outlined in Section 2 and Section 3.

Discussion questions – Lessons from existing taxonomies

1.1 What are the key benefits and/or limitations with existing skills taxonomies?
1.2 What features from existing skills taxonomies are important to retain or address in a new NST?

2. There are several potential use cases for a Taxonomy, with different benefits

A National Skills Taxonomy can support a range of use cases with different benefits. The vision for an NST must reflect our collective aspirations. Principles should guide the Taxonomy's design and development, but trade-offs may be required to balance these principles effectively.

2.1 A National Skills Taxonomy can support a range of use cases with different benefits

The potential of a well-designed NST is linked to how different actors adopt and apply it for the benefit of their stakeholders. On its own a skills taxonomy is a structured list of skills. The true value is unlocked when combined with other taxonomies and information. Application will vary, but the value created will be underpinned by a common language that is accepted and understood across the different systems. Dissemination and uptake of the NST could be driven by government policy or other mechanisms that support application.

However, as highlighted in Section 1, it is also important to be mindful of the unintended consequences that a poorly designed NST could have because of interactions with other frameworks.

The Australian government has also identified several use cases where an NST is essential to achieving policy objectives. For instance, the Australian Universities Accord emphasises the importance of a skills taxonomy in promoting lifelong learning and increased participation in learning. The Employment White Paper outlines the need to address skills shortages and proactively build a strong workforce, goals which can be supported through the implementation of an NST. In addition, the Australian Qualifications Framework aims to enhance the recognition of qualifications and skills across different education and training sectors. A skills taxonomy is crucial for aligning qualifications with industry need, while supporting improvements to recognition of credit and prior learning.

Table 1 provides an overview of the value of the NST when combined with other taxonomies and frameworks, illustrating how these combinations can enhance insights and enable activities related to skills, occupations, and qualifications.

Table 1: Use cases enabled by the NST and other taxonomies and frameworks

	Taxonomies and frameworks applied			
Use cases enabled	NST	ANZSCO	AQF	ANZSIC
1. Enhance career planning and development	✓	✓	✓	
2. Support skills-based hiring	✓	Possible		
3. Inform training product and course design	✓	Possible	✓	✓
4. Simplify and streamline skills recognition	✓		✓	
5. Identify, understand, and plan for future skills demand	✓	✓		✓
6. Inform strategic business decisions	✓	✓		✓
7. Develop workforces	✓	✓	✓	
8. Define workforce roles	✓	✓		
9. Dynamically respond to economic shifts and emerging roles	✓			

These are elaborated on in Table 2 including, impacted actors and expected benefits of these use cases. It is not intended to be exhaustive but illustrative of how an NST may be adopted and applied.

Table 2: Potential use cases and expected benefits

Use case	Actors	Expected benefits
1. Enhance career planning and development	Individuals	• Individuals considering a career change are better informed on how their skills compare with a target career, specific skills needed, and how they can address them through education.
2. Support skills-based hiring	Employers	• Employers expand their potential candidate pool through a shared understanding of the skills being sought and skills applicants possess. • 'Hidden markets' of individuals from non-traditional pathways with relevant skills can be identified and accessed. • Applicant skills can be more easily identified (and potentially verified) within hiring processes.
	Individuals	• Individuals have a more comprehensive understanding of the skills required to be able to apply for a certain role.
3. Inform training product and course design	Training product and course developers	• Increased relevance and attractiveness of educational programs, with clearer student return on investment.

	Tertiary education providers	• Students are more aware of the skills developed through qualifications and where they may be in need to inform decisions on potential jobs and careers,
4. Simplify and streamline skills recognition	Workers	• Reduce the burden on workers when seeking recognition of prior learning (RPL) through clearer articulation of the skills carried out on the job. • Lower skilled, more vulnerable workers would be empowered to have the skills they have developed both inside and outside of the workplace recognised.
	Tertiary education providers	• Improved alignment of study with recognised skills. • Streamline credit recognition and RPL through a common understanding of skills. • Expand tertiary education access through alternate entry.
	Students	• Improve mobility between providers and courses. • Reduce overlap in studies.
5. Identify, understand and plan for future skills demand	Government	• Higher quality labour market information as a result of a greater understanding of skills and skilled labour in the current and future labour markets. • Better identification of future skills needs in key sectors such as renewable energy, care and construction, and to respond to evolving technology including AI. • Enhanced ability to develop plans to address skills gaps and labour shortages.
6. Inform strategic business decisions	Employers	• Profile the diversity, quantity, and level of skills at their disposal to meet business objectives. • Understand regional differences in internal capacity and capability to inform operational planning. • Assess the local industry's skill base and identify potential areas of future comparative advantage, in anticipation of structural adjustments.
7. Develop workforces	Employers	• More effectively plan employee development through understanding existing skills of employees. • Assess whether any employees are underutilised and would be more productive in different roles. • Identify targeted training programs to address specific skill gaps.
	Employees	• Proactively plan for and invest in skills that will be critical to their organisations future success. • Assurance that efforts to increase skill levels will be recognised by future employers and remain transferable, ensuring that the education and training they undertake do not become sunk costs.
8. Define workforce roles	Employers	• Set performance expectations to manage their workforce. • Define progression pathways that can shape employee development decisions.
	Unions	• Outline clear standards and boundaries on expectations for workers. • Better identify and recognise skills within the limits of existing licensing and regulatory frameworks. • Clearly identify safety requirements.

It is important to note that there are also use cases where an NST will not be appropriate such as workplace relations or as a substitute for existing licencing and regulatory practices. It is crucial that the final governance and design of the NST guards against any potential significant unintended consequences that may arise.

2.2 The vision for a National Skills Taxonomy must reflect our collective aspirations

We are committed to engaging with stakeholders to refine and realise our vision for the NST. Stakeholder insights and feedback will be crucial for shaping our current vision so that it reflects our collective aspirations. Our indicative vision for the NST is:

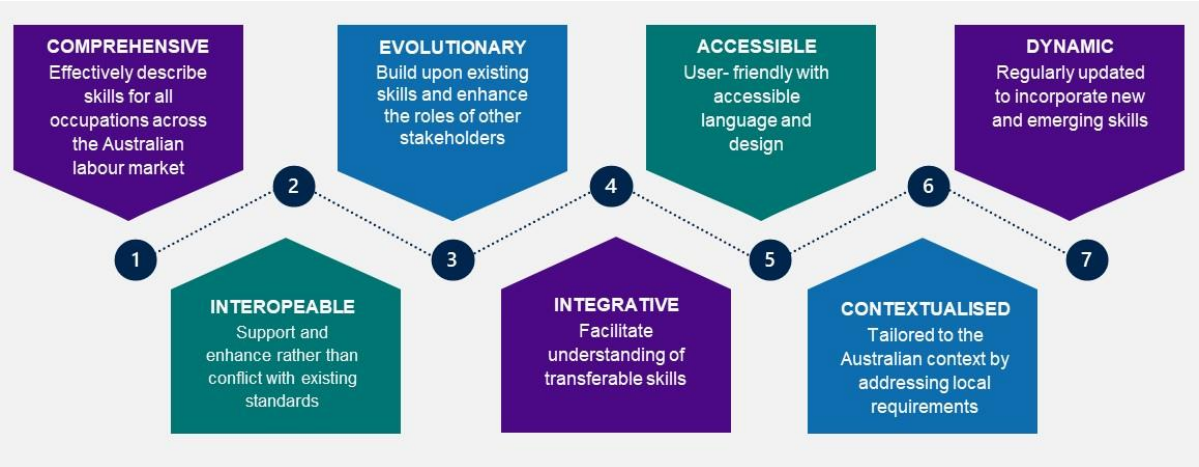
NST VISION

To improve connections between education and employment pathways, enabling future systems needed for lifelong learning, enhanced occupational mobility and career transitions, to address skills gaps and adapt to evolving economic and community needs.

2.3 Principles should guide design and development, but trade-offs may be required

The principles that underpin the NST require careful consideration. Effective governance, use, and maintenance are essential for ensuring the NST remains current, relevant, and widely supported. Figure 4 provides a summary of potential principles.

Figure *4*: *Key considerations for NST principles*



During this consultation process, the potential principles detailed in Table 3, along with others which are important to stakeholders, will be tested and refined. The final suite of NST principles will be shaped by the collective views of stakeholders, considering the trade-offs that may be necessary to balance them effectively. Principles have implications for design and development considerations, explored in section 3.

Table 3: Potential NST principles and indicative tensions

Principles	Description	Indicative tensions
Comprehensive	The NST should effectively describe skills for all occupations across the Australian labour market, covering a broad range of skills including foundation skills, employability skills, knowledge, personal attributes, and job-specific skills.	Balancing detailed descriptions for clarity and specificity with the need for regular updates can make the taxonomy cumbersome to manage. Skills may be identified that do not easily map to existing occupations or industries. ANZSCO as the basis for occupations is not considered exhaustive by industry and may need to be complimented by additional occupations.
Interoperable	The NST should align with existing standards like AQF, ANZSCO, and ANZSIC, supporting and enhancing these frameworks without replacing them to facilitate integrated solutions that bridge education and employment sectors. Alignment to other skills taxonomies and frameworks can also be considered.	Integrating a broad national framework with existing detailed standards may constrain flexibility and specificity needed for industry-specific applications. Alignment to outdated frameworks may lead stakeholders going 'outside' the system to address gaps e.g., skills for emerging roles.
Evolutionary	The NST should build upon existing skills systems and enhance the roles of unions, employer groups, and industry experts in informing skilling needs, while providing a unified framework for aggregated analysis.	There is a risk that the NST might be perceived as undermining established methods. This will require careful management to ensure the NST enhances rather than disrupts current systems.
Integrative	The NST should facilitate understanding of transferable skills, enabling workers to articulate their skills and identify career transitions, while assisting employers in finding talent with relevant technical skills.	Balancing detailed skill descriptions for specificity with broad applicability is crucial to maintain the utility of the taxonomy.
Accessible	The NST should be user-friendly, with accessible language and design, no licensing fees, and supported by guidance and stakeholder services, ensuring it is intuitive for non-technical users.	Ensuring simplicity and ease of use while maintaining the depth and detail needed for accurate skill categorisation can be challenging.
Contextualised	The NST should be tailored to the Australian context, addressing local job and qualification requirements, and using familiar language, while adhering to national and international data standards to maintain its integrity and credibility.	Developing a locally relevant taxonomy takes time and requires validation, complicated by potential data collection and evidence in niche areas. Strict adherence to data standards may limit the NST's ability to incorporate new and emerging skills, impacting its responsiveness and relevance.
Dynamic	The NST should be regularly updated to incorporate new and emerging skills, keeping it relevant and up to date with the evolving skills landscape, while garnering widespread support through collaborative consultations.	Frequent updates could undermine the stability of the taxonomy, making it difficult to track progress and trends, and potentially reducing stakeholder trust. Diverse stakeholder priorities may slow down development and adoption.

Discussion questions – Potential use cases for a National Skills Taxonomy

2.1 Where could an NST best add value for individuals, employers, and educators and how?

2.2 What are the potential unintended consequences or challenges of an NST that will need to be overcome?

2.3 What do you believe should be the overarching vision for the NST?

2.4 What guiding principles should underpin the taxonomy? Are there any non-negotiables?

2.5 How should principles be prioritised if trade-offs are required?

3. Building a National Skills Taxonomy is complex

A National Skills Taxonomy could take many forms. Key decisions are needed to inform the Taxonomy's structure and design. The Taxonomy will require robust governance, clear usage boundaries and ongoing maintenance.

3.1 A National Skills Taxonomy could take many forms

International jurisdictions have developed different methods for creating and implementing skills frameworks. A description of the approaches taken in the United States, European Union and Singapore is provided in Table 4. Each approach is tailored to the specific needs, economic contexts, and labour market dynamics of the country or region where they are used. In Australia, we can learn from these international approaches and adjust our approach to align with local regulatory, licensing and qualification systems, and with domestic skills needs. Following Table 4, some key learnings from these international approaches are explored.

Table *4*: *Example international skills frameworks taxonomies*

Framework	Overview[9]	Taxonomy structure[10]
Occupational Information Network (O*NET) – USA	O*NET is a comprehensive occupation-based database developed by the United States Department of Labor. The framework includes the following information about occupations: 1. Worker characteristics 2. Worker requirements 3. Experience requirements 4. Occupational requirements 5. Workforce characteristics 6. Occupation-specific information 7. Workforce characteristics.	The skills taxonomy component of O*NET is structured by: 1. Occupation (~1000) 2. Tasks (~20,000) 3. Skills (35 high-level categories), made up of: - Generalised work activities (~40) - Intermediate work activities (~330) - Detailed work activities (~2000) 4. Subjects, tools and methods, made up of: - Technology skills (~8800) - Tools used (~21,000) - Knowledge (~30)
Singapore Skills Frameworks (SFw)	The SFw uses an industry-based approach with a set of 34 industry sector Skills Frameworks (SFw). SFws are hierarchically structured as; 1. Industry clusters 2. Career tracks 3. Occupational categories 4. Skills and competencies	The skills taxonomy component of SFw is structured by: 1. Job roles (~2600) 2. Key tasks (~25,000) 3. Skills, made up of: - Critical work functions (~2000) - Technical skills and competencies (~2000)

[9] Department of Education (UK), 2023. 'A Skills Classification for the UK'.
[10] Department of Education (UK), 2023. 'A Skills Classification for the UK'.

	5. Proficiency levels.	
European Skills, Competences, Qualifications and Occupations (ESCO)	ESCO is the European Union's multi-lingual classification of 'competencies' required for different occupations in the European labour market. It is structured in three pillars: 1. Occupations 2. Skills / competences and knowledge 3. Qualifications.	The skills taxonomy component of ESCO is structured by: 1. Occupation (~3000) 2. Skills, made up of: - Transversal skills (~90) - 'Level 2' skills (~100) - 'Level 3' skills (~300) - 'Level 4' skills (~11,000) - Knowledge (~3000) 3. Qualifications (2,942) These categories of skills are aligned with the other pillars of ESCO to help users understand how skills apply to occupations and qualifications.

Skills taxonomies can vary significantly in their level of granularity. O*NET operates a higher level, making detailed analysis more challenging. For instance, it broadly defines 'computer programming skills', whereas the ESCO framework lists specific programming languages.[11] Singapore's SFW's are highly detailed, including 16 generic skills, 2,000 technical skills, and 25,000 key tasks across 1,600 occupations.[12] However, these more granular taxonomies can be more difficult to regularly update. These learnings can be considered in determining whether a higher-level or more granular system suits Australia's needs.

The methods for incorporating new skills and occupations also differ across taxonomies. O*NET heavily relies on sector experts to propose new roles to the U.S Department of Labour, often leading to delays.[13] ESCO leverages artificial intelligence to automatically maintain its occupation pillar. This is complemented by consultations with sector experts, member states, and the European Commission.[14] The SFw frameworks are developed collaboratively with industry stakeholders.[15] These varied approaches highlight that consideration of artificial intelligence may offer a faster and more efficient method for updating a skills taxonomy.

Lastly, the connection with education varies among taxonomies. O*NET and ESCO do not directly connect with education. However, ESCO's qualification pillar does compile information on qualifications.[16] In contrast, Singapore's Skills Frameworks (SFw) demonstrate a closer alignment with education, specifically through the Workforce Skills Qualifications (WSQ) national credential system, which references the skills developed under the frameworks.[17] The Skills Framework provides key information on the job roles and skills needed to perform various tasks and remain transferable within the job market. Looking to Singapore's model might offer valuable insights for developing a taxonomy that effectively links qualifications and related skills to job roles.

[11] Frontier Economics, 2022. 'Review of skills taxonomies'. https://www.gov.uk/government/publications/review-of-skills-taxonomies-may-2022
[12] Department of Education (UK), 2023. 'A Skills Classification for the UK'.
[13] Frontier Economics, 2022. 'Review of skills taxonomies'.
[14] Frontier Economics, 2022. 'Review of skills taxonomies'.
[15] Frontier Economics, 2022. 'Review of skills taxonomies'.
[16] European Commission, 2024. 'ESCO v1'.
[17] Frontier Economics, 2022. 'Review of skills taxonomies'.

3.2 Key decisions will shape the Taxonomy's final design

The final NST will be influenced by key decisions that shape the design and development of the Taxonomy. Key decisions are outlined in Table 5.

It is important to note that both nationally and internationally a common skills definition has been difficult to achieve. To ensure that the NST can appropriately identify skills and react to emerging skills further technical work will occur following this consultation to define the required data quality standards.

Table 5: Key design decisions

Design decision	Considerations
How should skills be **defined**?	• Different skills taxonomies and stakeholders define a 'skill' in various ways, reflecting diverse priorities and needs. • It is important to consider the various groupings of skills that have emerged. These include core skills, technical skills, behavioural skills, cross functional skills, specialist skills, digital/technology skills, psychomotor skills, and cultural competency skills.
What level of **granularity** is required?	• Skills differ in their level of granularity, from highly detailed and specific to broader skills. • For example, O*NET lacks detail on the specific technology skills required for each occupation, whereas ESCO fills this gap. • The level of skills granularity may have an impact on taxonomy use cases. For example, the granular presentation of skills in ESCO is more suitable for providing specific career advice. However, this level of detail may not be as important for other use cases.
What level of **information** and other **attributes** should be attached to a skill?	• To enable clearer understanding and easier identification of skills within a taxonomy, Rich Skills Descriptors (RSD) can be considered. • RSDs are a metadata package that provides a common definition of a skill including the context behind the skill. • RSDs typically include features such as a short skill name, skill statements, skill categories, and metadata. The metadata may include information connecting the skill to specific keywords, among other considerations. • RSDs could be designed so that they are both human and machine readable.
Should **proficiency** and/or **levelling** be reflected? How?	• Levelling provides a structured framework that categorises skills and roles into different tiers or stages, such as entry-level, mid-level, and advanced. Proficiency, on the other hand, describes the degree of competence within each of these levels. • Proficiency levels within each stage of the levelling system can indicate the expected competencies. As individuals progress through the levels, they achieve high proficiency, moving from basic skills at lower levels to advanced skills at higher levels. This progression ensures that as individuals advance in their careers, they demonstrate increased proficiency in the necessary skills. • Consideration is also required on how to accurately portray the degree of expertise within certain specialisations such as arts and creative industries and the role of master craft persons.
What should be emphasised in the taxonomies	• The structure of the taxonomy is key to its development. Most taxonomies are hierarchical, organising skills into broad categories with multiple levels of subcategories. However, the emphasis within a taxonomy can vary significantly, influencing its utility and application.

Design decision	Considerations
organising structure?	• Key elements that can be emphasised in the taxonomy structure include skill type, occupation, and industry.
How should the taxonomy **align** with other existing taxonomies?	• The Noonan review of the AQF identified skills as one of three key domains in a potential revised framework, with 5 focus areas. • Mapping of skills to ANZSCO and ANZSIC taxonomies can support better mapping of skills to occupation and industries where relevant. • Interoperability with international taxonomies could present different opportunities for the NST and stakeholders.
What **additional features** should be considered?	• Ensuring the NST meets the needs of various users requires consideration of both technical and public accessibility. • Machine readable formats enable seamless integration with software systems, such as job matching platforms and HR systems. • User-friendly formats are designed for the general public, making the information accessible for individuals without technical expertise. This could be in the form of a user-friendly website with clear navigation and explanations. • Technology solutions such as an Application Programming Interface (API) to parse text against the NST could also be considered.

Discussion questions – Building a National Skills Taxonomy

Design considerations

3.1 What should an NST look like? Considerations include:

- Definitions and nomenclature
- Structure (hierarchy, skill groupings and typologies)
- Granularity
- Information attached to each skill
- Proficiency and levelling
- Alignment to other taxonomies

3.2 Are there any additional features or key considerations for an effective design of the NST to support its use? Considerations could include supporting materials, usage guidelines or technological solutions that will enable or better facilitate NST usage.

3.3 Robust governance; skill identification, standards and procedures will be required

Governance

Existing taxonomies in Australia each have governance models involving structured stakeholder consultation and periodic reviews to ensure effective management, ongoing relevance, and accuracy. For example:

- The ACSF is managed by the Australian Government Department of Employment and Workplace Relations, with periodic reviews and stakeholder consultation to maintain relevance.

- The ASC is governed by JSA, which conducts ongoing development, review, and maintenance.
- Training Packages are endorsed by Skills Ministers with input from Senior Responsible Officers, an assurance body (currently the Department of Employment and Workplace Relations) and Jobs and Skills Councils (JSCs).

Governance for an NST must be appropriate to support adoption and use. For example, governance requirements may differ if the NST is to be built and made available for people to use as they choose, compared to if use is to be mandated by Governments in some way. It must also work with other governance arrangements such as JSA Ministerial Advisory Board (MAB), a new ATEC and the Skills and Workforce Ministerial Council. Ultimately, a clear governance model for the NST will foster trust among stakeholders, leading to more comprehensive and accepted outcomes.

Before committing to a specific governance model for the NST, it is important to explore and consider various options. Each model has its own strengths and limitations, and stakeholder input will be crucial in identifying the most suitable approach. Some governance options are explored in Table 6.

Table 6: Governance model options

Governance model	Strengths	Limitations
1. Managed within JSA and existing governance (e.g. MAB or Commissioner approval)	Leverages JSA's existing stakeholder relationships and expertise in workforce data management.	Representation is not exhaustive. For example, there is no direct representative from education peak bodies or institutions.
2. New bespoke governance model	Tailored to the specific needs of the NST. Could be expanded to include governance of other key taxonomies and frameworks.	Higher setup and operational costs.
3. National governance through Skills and Workforce Ministerial Council	Leverages national perspectives. Builds buy-in across Governments to promote use.	Building consensus can take time, meaning that decisions can be comparatively slower.
4. Open skills taxonomy	Encourages broad participation and collaboration.	Challenges in ensuring quality and consistency. Potential for a lack of clear authority.

Identifying and validating skills for inclusion

The process to identify and validate skills for inclusion in the taxonomy can take different approaches. Table 7 outlines two primary approaches, and some key considerations.

Table 7: Approaches for the identification and validation of skills

Approach	Considerations
Data driven approaches that identify and validate skills using, for example: • Australian job advertisement data; • Training package data; • regulatory and licensing information; • education qualifications; • international frameworks and taxonomies; • big data, advanced analytics, and AI.	• Can support earlier identification of emerging skills. • Requires significant investment in technology and data infrastructure. • Lacks context for understanding the nature of skills and how they may be applied.
Consultative approaches that involve direct input from and collaboration with industry stakeholders. This method leverages qualitative insights and expertise to determine and validate skills inclusions. It can also be used to gather input on necessary updates and changes.	• Provides deep industry-specific, on the ground insights. • May be slower and more resource intensive. • Relies heavily on the availability and willingness of stakeholders to participate. • May be impacted by historical narratives / perspective bias.
One or a combination of these approaches may be taken. This will include consideration of when these approaches may be implemented in the process. This decision will likely have implications for the design considerations explored in section 3.2.	

Standards and procedures

Developing policies that outline the usage of the NST is crucial for ensuring its effective and accurate application. These policies should provide clear guidance on the proper use of the taxonomy, its limitations, and potential misuse scenarios. This will help prevent misuse or misinterpretation of the taxonomy data, thereby protecting its integrity.

Enabling infrastructure, storage and dissemination methods are also needed to enable successful use cases. This includes identifying, developing, and implementing the necessary technological solutions to support the use and maintenance of the NST.

Various channels can be considered for data dissemination, including:

- Datasets made available for download in CSV and MS Excel formats.
- Datasets made available via an API.
- Web pages which provide each skill with a consistent and open online presence.

To retain the currency and relevance of the NST, it is essential to establish a regular review and update cycle that reflects changes in:

- The Australian labour market, as occupations emerge and evolve, making skill requirements dynamic.
- Language used to refer to occupations, skills, and technologies, which often changes as new terms become more widely recognised. Ensuring the taxonomy adapts to these evolving names is crucial for staying current.
- Technological advancements, as new tools and platforms become integral to occupations.

To ensure that updates are accurate, reliable, and managed effectively, the development of data quality standards or a data quality framework should be considered.

Data quality standards are specific criteria defining the accuracy, consistency, completeness, and timeliness of data, providing measurable goals.

A **data quality framework**, on the other hand, includes these standards but also incorporates the processes, tools, roles, and responsibilities needed to manage and maintain data quality.

Discussion questions – Building a National Skills Taxonomy

Implementation considerations

4.1 What are the most appropriate ongoing governance arrangements for the NST and why?

4.2 How should the NST be updated and maintained? Considerations include:

- How skills are identified for inclusion, including initial identification and validation
- The rate at which update should occur
- The development of data quality standards or a data quality framework

4.3 Which storage or dissemination methods / infrastructure would be most valuable for enabling effective use of the NST?

4. Stakeholder views are pivotal to the final design

There are two ways for stakeholders to provide input into the design and structure of the NST in coming months.

1. Written submissions	JSA welcomes written feedback on this Discussion Paper from all interested parties. To make a submission visit https://www.jobsandskills.gov.au/consultations/national-skills-taxonomy-discussion-paper Submissions will close at **5pm AEST Friday 9 August 2024.** *Note: written submissions will be provided to Nous Group, an independent management consultancy supporting JSA to deliver stakeholder workshops.*

2. Stakeholder workshops	JSA is planning a comprehensive program of stakeholder workshops commencing in July and concluding in August 2024. These workshops will be an important opportunity for potential future users of the taxonomy, experts, and other key stakeholders to share their views and help shape the Taxonomy's development. Proposed discussion topics and questions for stakeholders have been provided throughout this document and are summarised in Appendix A. Details of workshops will be communicated to stakeholders in June 2024.

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Appendix A: Discussion topics and questions for stakeholders

Table 8 | Discussion topics and questions for stakeholder consultation

Discussion topic	Indicative questions	Section
1. Lessons from existing taxonomies	1.1 What are the key benefits and/or limitations with existing skills taxonomies? 1.2 What features from existing skills taxonomies are important to retain or address in a new NST?	1.3 1.3
2. Potential use cases for a National Skills Taxonomy	2.1 Where could an NST best add value for individuals, employers and educators and how? 2.2 What are the potential unintended consequences or challenges of an NST that will need to be overcome? 2.3 What do you believe should be the overarching vision for the NST? 2.4 What guiding principles should underpin the taxonomy? Are there any non-negotiables? 2.5 How should principles be prioritised if trade-offs are required?	2.1 2.1 2.2 2.3 2.3
3. Building a National Skills Taxonomy: Design considerations	3.1 What should an NST look like? Considerations include: - Definitions and nomenclature - Structure (skill groupings and typologies) - Granularity - Information attached to each skill - Proficiency and levelling - Alignment to other taxonomies 3.2 Are there any additional features or key considerations for an effective design of the NST to support its use? Considerations could include supporting materials that will enable or better facilitate NST usage.	3.2 3.2
4. Building a National Skills Taxonomy: Implementation considerations	4.1 What are the most appropriate ongoing governance arrangements for the NST? 4.2 How should the NST be updated and maintained? Considerations include: - How skills are identified for inclusion, including initial identification and validation - The rate at which update should occur - The development of data quality standards or a data quality framework 4.3 Which storage or dissemination methods / infrastructure would be most valuable for enabling effective use of the NST?	3.3

Appendix B: Example definitions of skills

AQF review[18]	Skills are the abilities required to take action, acquired through deliberate, systematic, and sustained effort'. Importantly Knowledge, Skills and Application are linked through action.
OECD[19]	Skills are the ability and capacity to carry out processes and be able to use one's knowledge in a responsible way to achieve a goal. They involve mobilising knowledge, skills, attitudes and values to meet complex demands. The OECD Learning Compass 2030 distinguishes between three types of skills: cognitive and metacognitive skills; social and emotional skills; and practical and physical skills.
ESCO[20]	Skill means the ability to apply knowledge and use know-how to complete tasks and solve problems. They can be described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments). While sometimes used as synonyms, the terms skill and competence can be distinguished according to their scope. The term skill refers typically to the use of methods or instruments in a particular setting and in relation to defined tasks. The term competence is broader and refers typically to the ability of a person - facing new situations and unforeseen challenges - to use and apply knowledge and skills in an independent and self-directed way.
ONET[21]	A skill is the ability to perform a task well. It is usually developed over time through training or experience. A skill can be used to do work in many jobs or it can be used in learning.
Singapore Skills Framework[22]	The Singapore Skills Framework defined skills under two broad categories: (a) Technical Skills and Competencies, which comprises of occupation/job-specific knowledge, skills and abilities that a person needs to have to perform the various tasks. (b) Critical Core Skills (CCS), as identified for each job. CCSs are employability/transferable skills and competencies.

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