Unpacking STEM skills for vocational education

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NCVER – what we do

• Data standards
• Statistics
• Research

-> vocational education

www.ncver.edu.au
Is VET a major ‘STEM’ player?

TOTAL STEM WORKFORCE

STEM workforce

32% University qualified

68% Vocational Education & Training (VET) qualified

2.3 MILLION

Infographic from Office of the Chief Scientist 2016

Data: ABS Census 2011
What is vocational education and training?

- part of tertiary education and training
- provides accredited training in job related and technical skills
- can ‘start’ in secondary school (SSC)
- alternative or bridge to higher education (uni degrees)
- covers a large number of careers and industries like trades and business work, social work, health and hospitality
- Entails a range of credentials (Certificates – Diplomas)
VET in schools

- programs undertaken by school students as part of the senior secondary certificate
- typically Certificate I-III
- apprenticeship/traineeship possible
- partnership between schools, industry and Registered Training Organisations (RTO)
Why did we choose ‘STEM skills’ as a research project?

> lack of clarity of what STEM skills are
> different measurements
> VET contribution is underreported
### People with ‘STEM’ workforce qualifications

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Defining ‘STEM’ skills

People
- Everyone
- General workforce
- Science and technology workforce

Outcomes
- Better Education
- Jobs
- Supporting economy & productivity

Type of Skills
- Technical/task skills,
- Social skills
- Higher-order cognitive skills

Education
- Interdisciplinary, meta-disciplinary, integrated
- Traditional: discipline or subject specific
Conceptual definition of STEM education

- STEM taught and applied
  - traditional and discipline specific
  - interdisciplinary and integrated

- Outcome focussed
  - to solve real world challenges

- Investing in people
  - technical and scientific skills
  - critical and creative thinking skills

- Teachers/Educators,
- Scientists, engineers and digital specialists
- Technologically proficient workers
- Literate citizens
Unpacking what sits within STEM

The House of STEM

- Improving career advice, economy, innovation, productivity
- Technical occupation skills, e.g. coding, design, construction
- Advanced cognitive skills, e.g. critical and creative thinking
- Socio – emotional skills, e.g. resilience, curiosity, empathy
- Foundational literacies, e.g. numeracy

STEM Shed

Classifications in STEM disciplines
The STEM debate has been focused on uni pathways...

...there are other options!
VET contributions

• **VET strong** in the technology sector
  – foundational literacies
  – targeted skill training
  – workplace-based, industry collaboration
  – applied research & technology

• **New futures?**
  – Higher apprenticeships
  – P-tech schools
  – Higher education schools
My Skills

Australia’s directory of training
Summary

- Vocational education and training is a viable alternative to university education

- VET strong in
  - skill development for all
  - foundational literacies
  - applied education
  - industry collaboration

- STEM is only an umbrella term!
  - Use specific skill/subject term
Upcoming NCVER releases - 18 Oct

- What is STEM? The need for unpacking definitions and applications
- Measuring STEM in vocational education and training
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