Non-cognitive Skills in Education: Australian and International Perspectives

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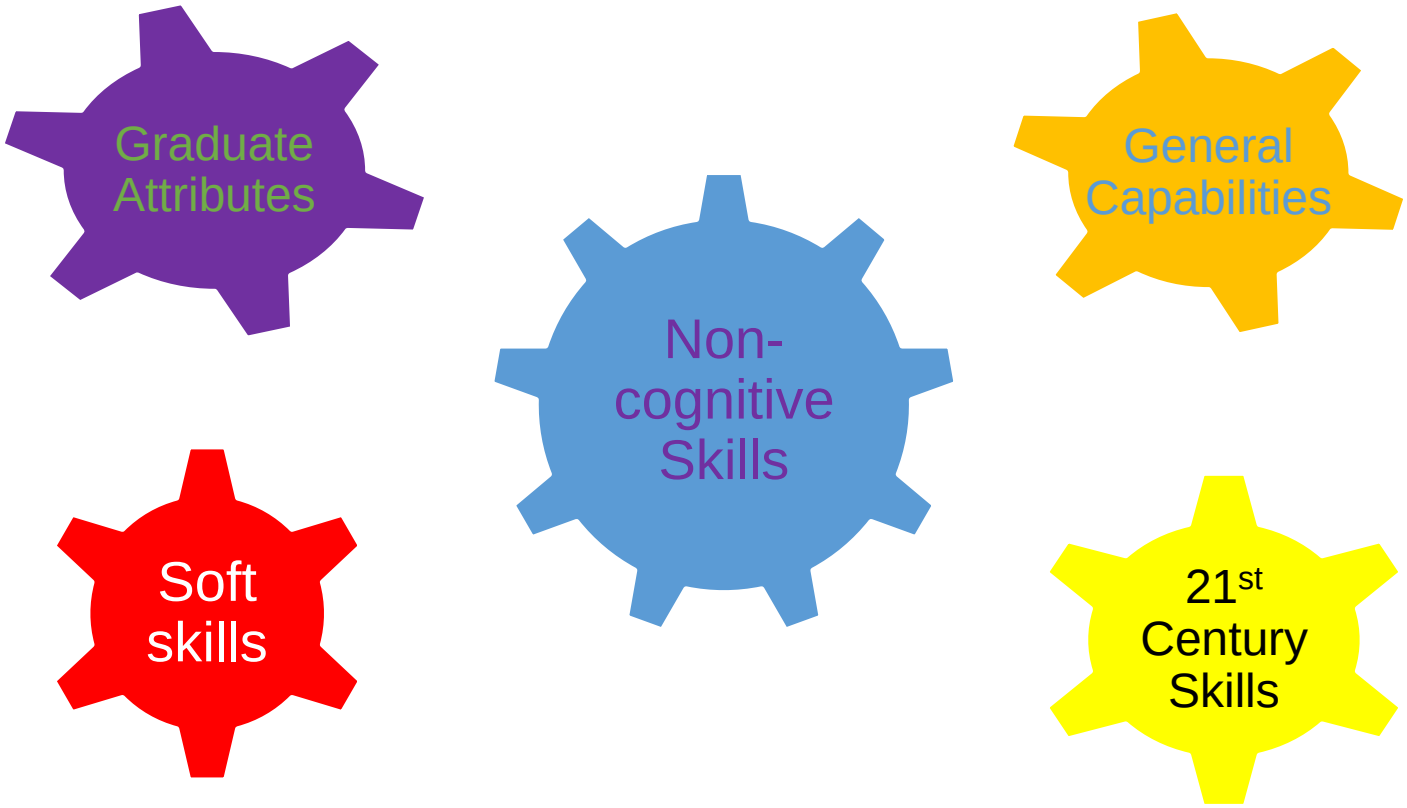

Graduate Attributes
General Capabilities
Non-cognitive Skills
Soft skills
21st Century Skills

Fadel & Trilling (2015)
"Four-dimensional Education"
Center for Curriculum Redesign

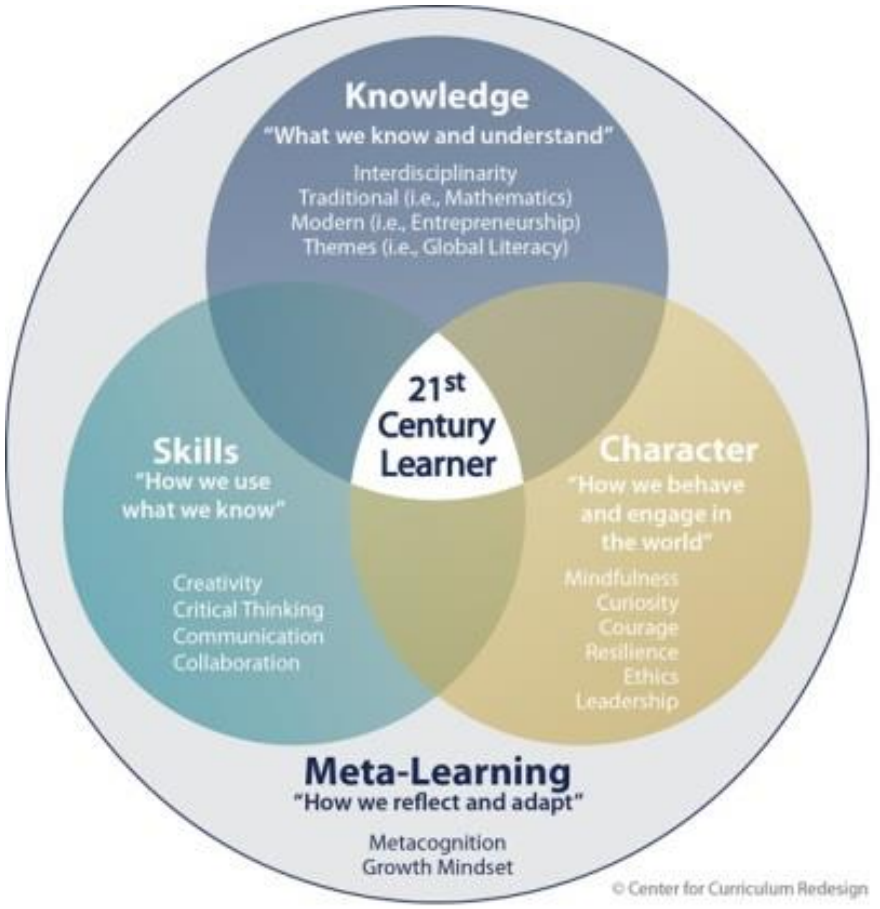
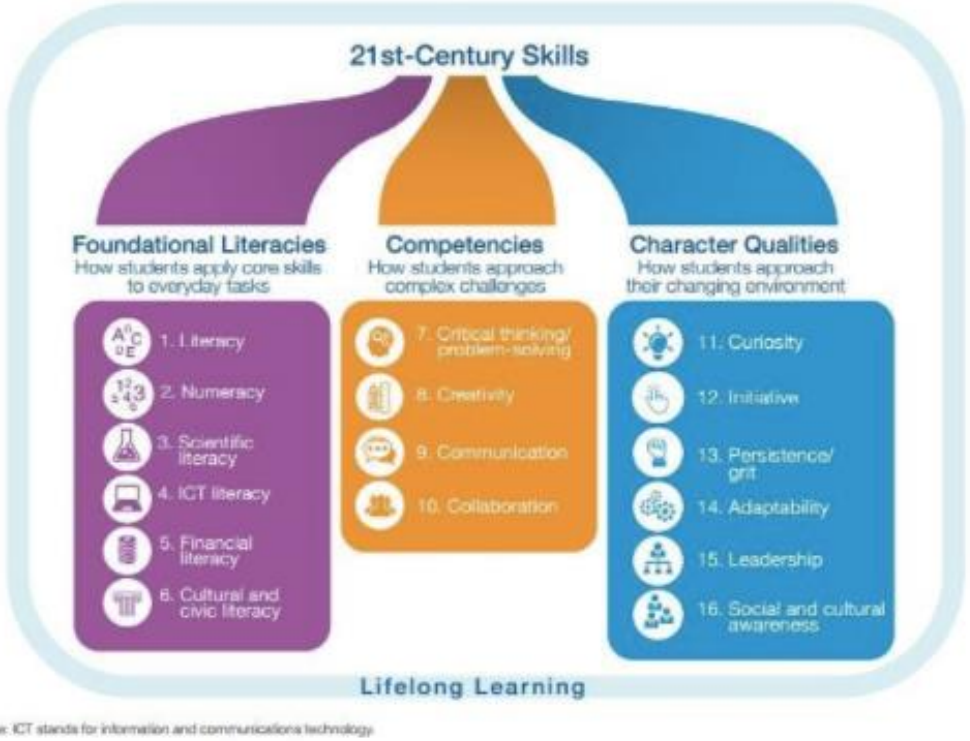


Exhibit 1: Students require 16 skills for the 21st century



Note: ICT stands for information and communications technology

World Economic Forum. (2016). *What are the 21st-century skills every student needs?* Available at https://www.weforum.org/agenda/2016/03/21st-century-skills-future-jobs-students/

Table 1: Terms describing key noncognitive skills

Assertiveness	Adaptability	Cheerfulness	Collaboration
Collegiality	Communications	Confidence	Coping with Stress
Creativity	Cultural Competence	Curiosity	Dependability
Determination	Effortful Control	Enthusiasm	Entrepreneurialism
Ethical Behavior	Fairness	Friendliness	Generosity
Grit	Growth Mindset	Honesty	Imagination
Innovation	Integrity	Kindness	Leadership
Liveliness	Moderation	Optimism	Organization
Patience	Persistence	Planning	Professionalism
Punctuality	Resilience	Responsibility	Self-Consciousness
Self-Esteem	Self-Regulation	Sociability	Teamwork
Time Management	Tolerance	Trustworthiness	Work Ethic

Roberts, R.D., Martin, J.e., & Olaru, G. (2015). *A Rosetta Stone for noncognitive skills*. Available at http://asiasociety.org/files/A_Rosetta_Stone_for_Noncognitive_Skills.pdf

Table 2: Terms describing key noncognitive skills realigned by the Big Five factors

Conscientiousness	Agreeableness	Emotional Stability	Openness	Extraversion
Dependability	Collaboration	Confidence	Creativity	Assertiveness
Grit	Collegiality	Coping with Stress	Curiosity	Cheerfulness
Organization	Generosity	Moderation	Global Awareness	Communication
Persistence	Honesty	Resilience	Growth Mindset	Friendliness
Planning	Integrity	Self-Consciousness	Imagination	Leadership
Punctuality	Kindness	Self-Esteem	Innovation	Liveliness
Responsibility	Trustworthiness	Self-Regulation	Tolerance	Sociability

Graduate attributes (e.g., Artess, Hooley, & Mellors-Bourne, 2017)

- Aspiration
- Autonomy
- Career management
- Communication skills
- Creativity
- Critical thinking skills
- Customer awareness
- Efficiency
- Emotional intelligence
- Enterprise & entrepreneurship
- Ethics
- Self-management
- Multi-tasking
- Opportunity awareness
- Positive attitude
- Presentation skills
- Problem solving
- Professional knowledge
- Resilience
- Flexibility & adaptability
- Giving & receiving feedback
- Independent thinking
- Initiative & self-direction
- Inter-personal skills
- Social intelligence
- Team-working
- Time management
- Willingness (& capability) to learn
- Work ethic
- + Key literacies

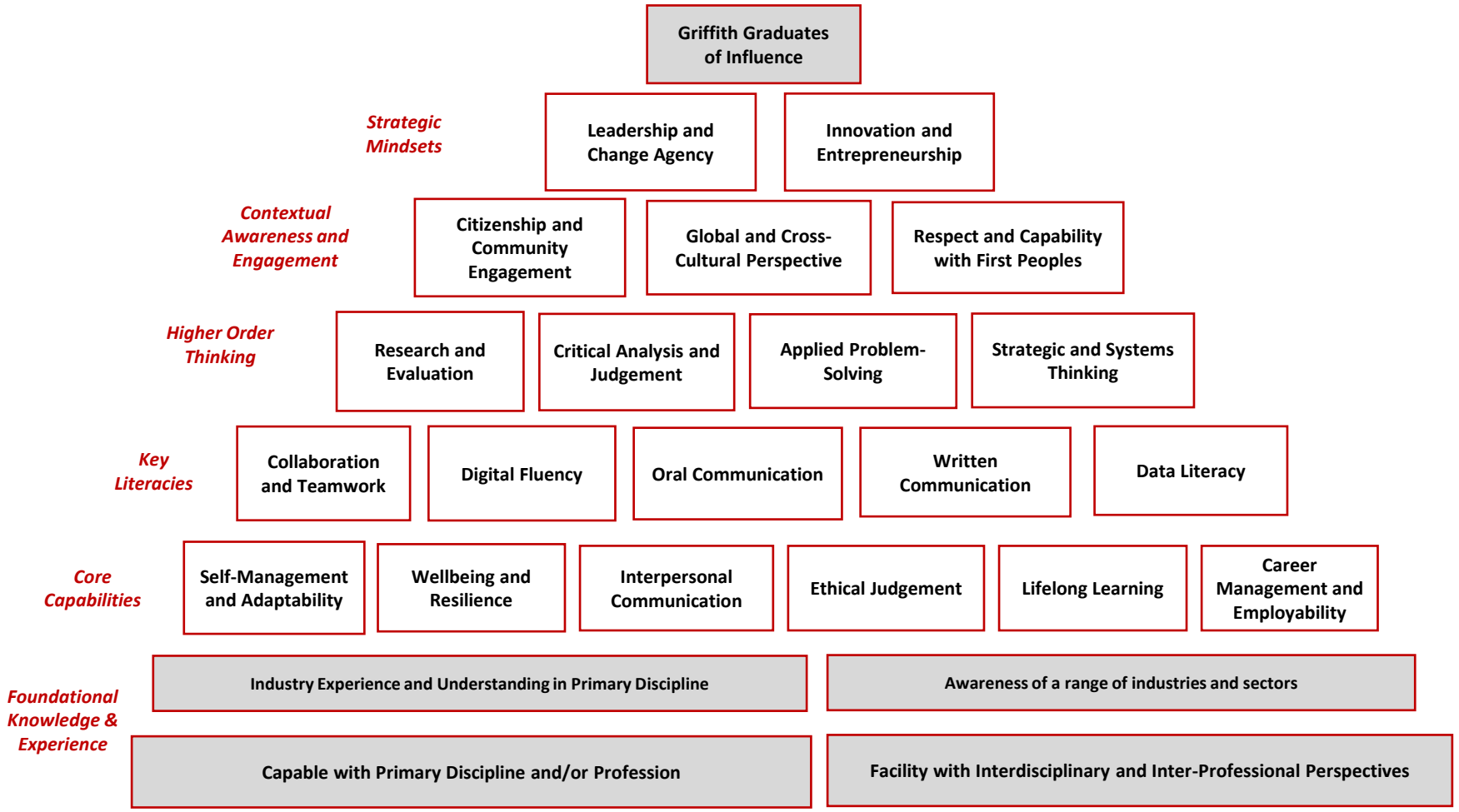
Griffith University

- Knowledgeable & skilled, with critical judgement
- Effective communicators & collaborators
- Innovative, creative, & entrepreneurial
- Socially responsible & engaged with their communities
- Culturally capable when working with First Australians
- Effective in culturally diverse & international environments

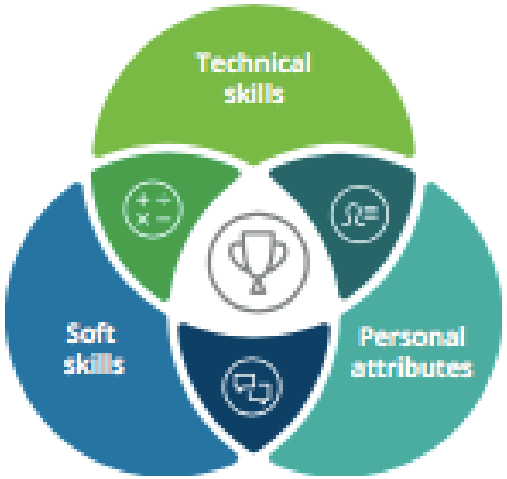
Glasgow University

- Subject specialists
- Investigative
- Independent & critical thinkers
- Resourceful & responsible
- Effective communicators
- Confident
- Adaptable
- Experienced collaborators
- Ethically & socially aware
- Reflective learners

Griffith Transferable Skills / Professional Capabilities / Employability skills



Soft Skills (Deloitte Access Economics, 2017)



Deloitte Access Economics. (2017). *Soft skills for business success.* Available at https://www2.deloitte.com/au/en/pages/economics/articles/soft-skills-business-success.html#

Australian P – 12 Curriculum Framework

Learning areas

General capabilities

Cross-curriculum priorities

Why the interest?

- Contribute to student's ability to make the most of available learning opportunities (Guttman & Schoon, 2013; OECD, 2016)
- As important as cognitive skills in predicting later life outcomes (OECD, 2014)

Deloitte Access Economics (2017)

Top 10 skills

in 2020	in 2015
1. Complex Problem Solving	1. Complex Problem Solving
2. Critical Thinking	2. Coordinating with Others
3. Creativity	3. People Management
4. People Management	4. Critical Thinking
5. Coordinating with Others	5. Negotiation
6. Emotional Intelligence	6. Quality Control
7. Judgment and Decision Making	7. Service Orientation
8. Service Orientation	8. Judgment and Decision Making
9. Negotiation	9. Active Listening
10. Cognitive Flexibility	10. Creativity

Source: Future of Jobs Report, World Economic Forum

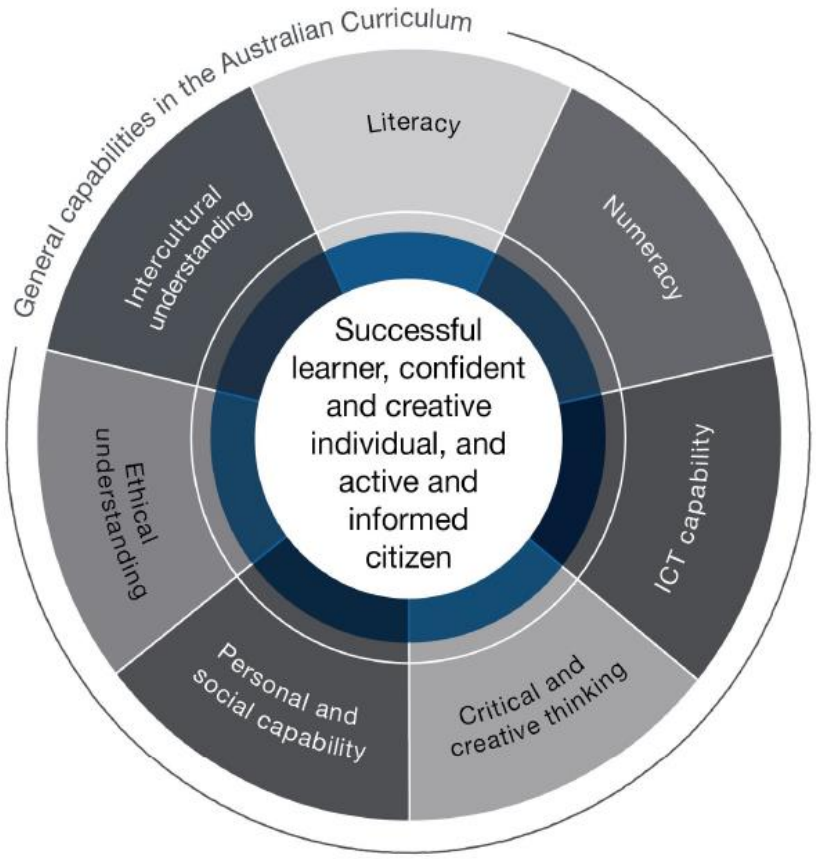
World Economics Forum. (2106). *The 10 skills you need to thrive in the Fourth Industrial Revolution*. Available at https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution

Australian P – 12 Curriculum Framework

Learning areas

General capabilities

Cross-curriculum priorities



Australian Curriculum, Assessment, and Reporting Authority www.australiancurriculum.edu.au

General capabilities: Personal and Social Capability
Self-management
Self-awareness
Personal and Social Capability
Social management
Social awareness

Appropriate emotional expression
Resilience, confidence, & adaptability
Self-management
Self-discipline & goal-setting
Independence & initiative

Level 1b
Typically by end of Foundation Year:
Become confident resilient and adaptable
identify situations that feel safe or unsafe, approaching new situations with confidence
Express emotions appropriately
express their emotions constructively in interactions with others
Develop self-discipline and set goals
follow class routines to assist learning
Work independently and show initiative
attempt tasks independently and identify when and from whom help can be sought

Level 4
Typically by end of Year 6:
Develop self-discipline and set goals
analyse factors that influence ability to self-regulate; devise and apply strategies to monitor own behaviour and set realistic learning goals
Work independently and show initiative
assess the value of working independently, and taking initiative to do so where appropriate
Become confident resilient and adaptable
devise strategies and formulate plans to assist in the completion of challenging tasks and the maintenance of personal safety
Express emotions appropriately
explain the influence of emotions on behaviour, learning and relationships

Level 6
Typically by end of Year 10:
Become confident resilient and adaptable
evaluate, rethink and refine approaches to tasks to take account of unexpected or difficult situations and safety considerations
Express emotions appropriately
consider control and justify their emotional responses, in expressing their opinions, beliefs, values, questions and choices
Work independently and show initiative
establish personal priorities, manage resources effectively and demonstrate initiative to achieve personal goals and learning outcomes
Develop self-discipline and set goals
critically analyse self-discipline strategies and personal goals and consider their application in social and work-related contexts

- Development of general capabilities within each Curriculum Learning Area
- E.g., Science: Personal and social capability
  - expands students' capacity to question, solve problems, explore and display curiosity
  - use scientific knowledge to make informed choices about issues that impact their lives such as health and nutrition and environmental change
  - consider the application of science to meet a range of personal and social needs

Challenges

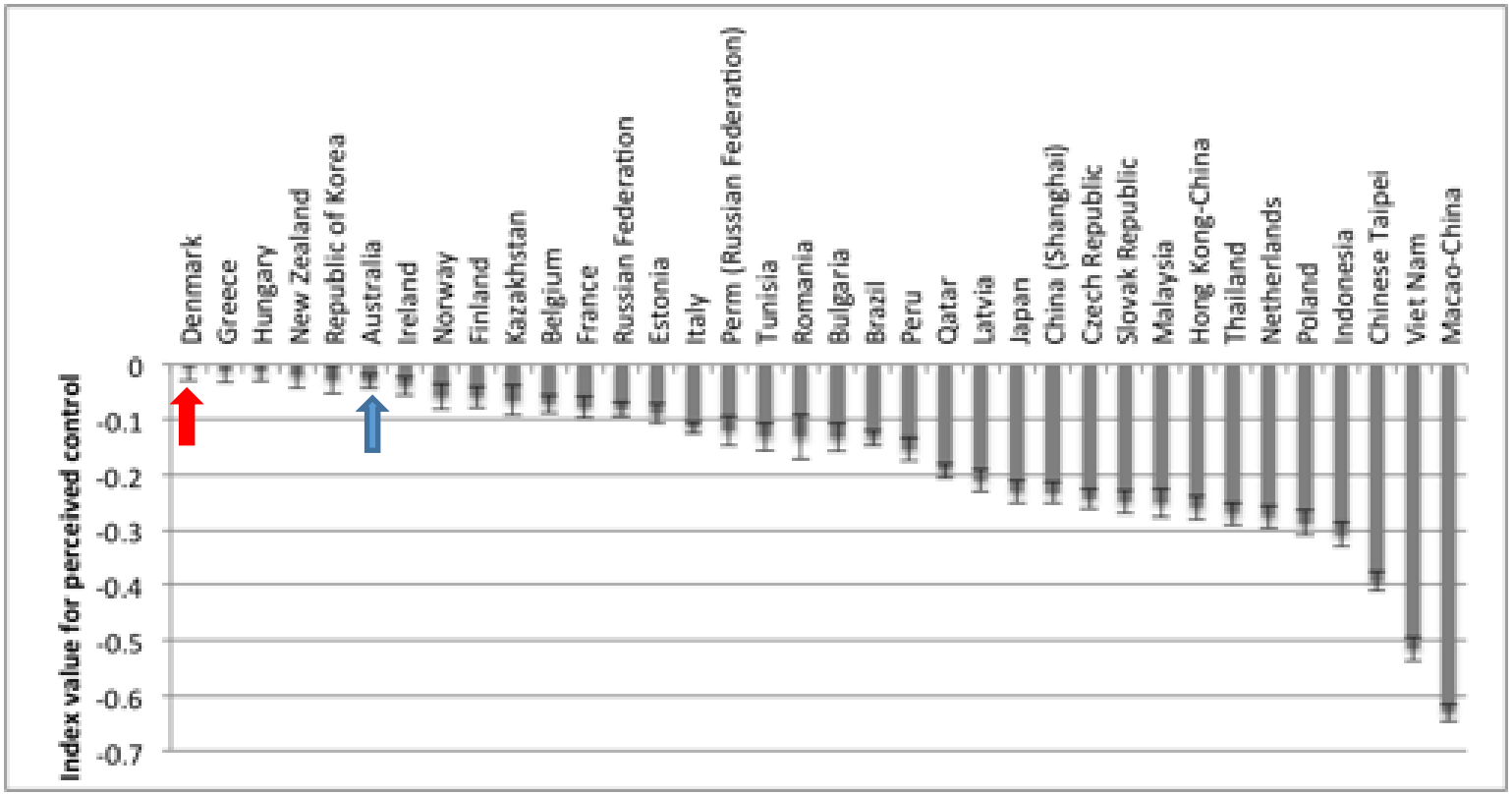
- Cross-curricular approach to teaching and assessing general capabilities means that the general capabilities can become secondary to the key learning area in which they are embedded
  - need to make connections to general capabilities within a key learning area explicit
  - teachers and assessors need to understand the influence of the curriculum context on expression on the general capabilities
- Teachers' lack of familiarity with and confidence in identifying general capabilities, and then embedding them in key learning areas
- Lack of time and the pressure in a crowded curriculum
- Students' lack of awareness of them as domains of learning

- Lack of clarity about whether these should be assessed on top of, or as a part of, assessment of the key learning areas
- Lack of available resources to support assessment

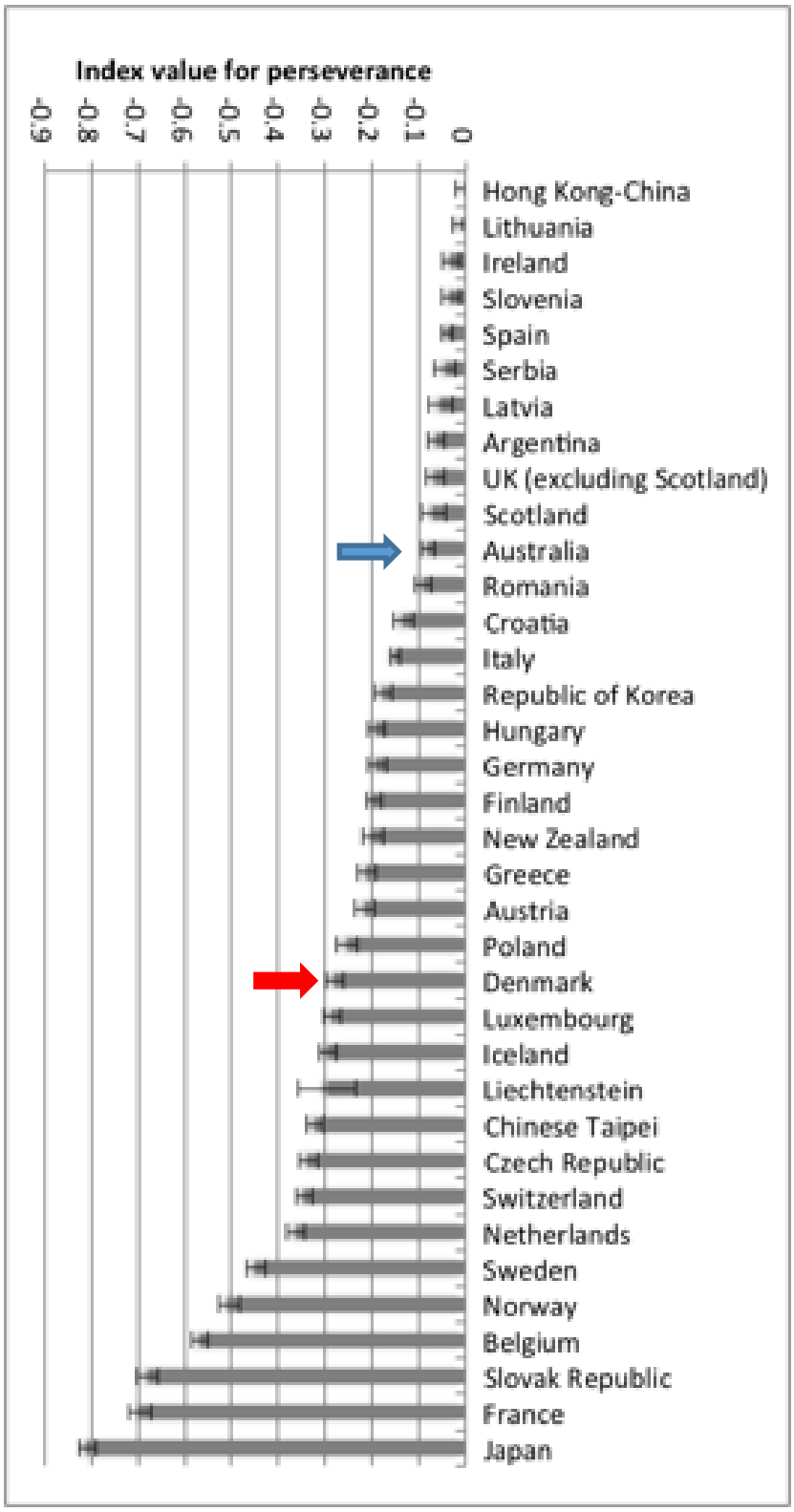
Australian Council for Educational Research (2015) https://rd.acer.org/article/assessing-general-capabilities

Assessment

- National standardised testing only for literacy (including language conventions) and numeracy
  - National Assessment Program- Literacy And Numeracy (NAPLAN) every 2nd year from Grade 3 – 9
    - No specific assessment for non-cognitive skills
  - Programme for International Student Assessment (PISA) at 15 years (final compulsory year)
    - Assessment of Math, Reading, and Science literacy + some non-cognitive skills
    - Approx. 10 – 15000 Australian 15-year-olds



Biddle, N., & Ball, S. (2014). *Focusing on the right measures- Non-cognitive ability and the other education gap.* Available at https://thenumbercruncherdotorg.wordpress.com/2014/12/01/focusing-on-the-right-measures-non-cognitive-ability-and-the-other-education-gap/

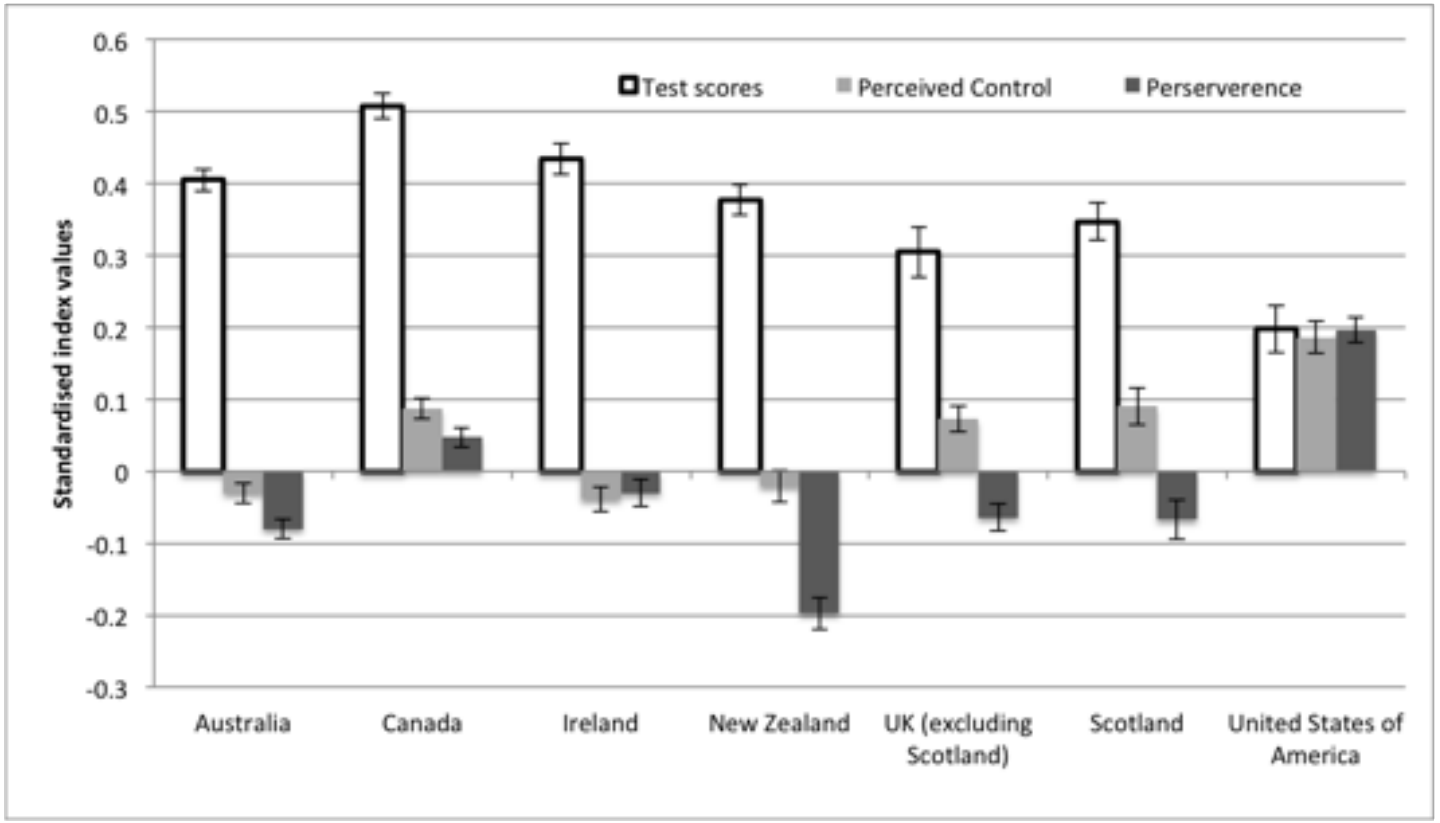

Index value for perseverance
-0.9
-0.8
-0.7
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0
Hong Kong-China
Lithuania
Ireland
Slovenia
Spain
Serbia
Latvia
Argentina
UK (excluding Scotland)
Scotland
Australia
Romania
Croatia
Italy
Republic of Korea
Hungary
Germany
Finland
New Zealand
Greece
Austria
Poland
Denmark
Luxembourg
Iceland
Liechtenstein
Chinese Taipei
Czech Republic
Switzerland
Netherlands
Sweden
Norway
Belgium
Slovak Republic
France
Japan

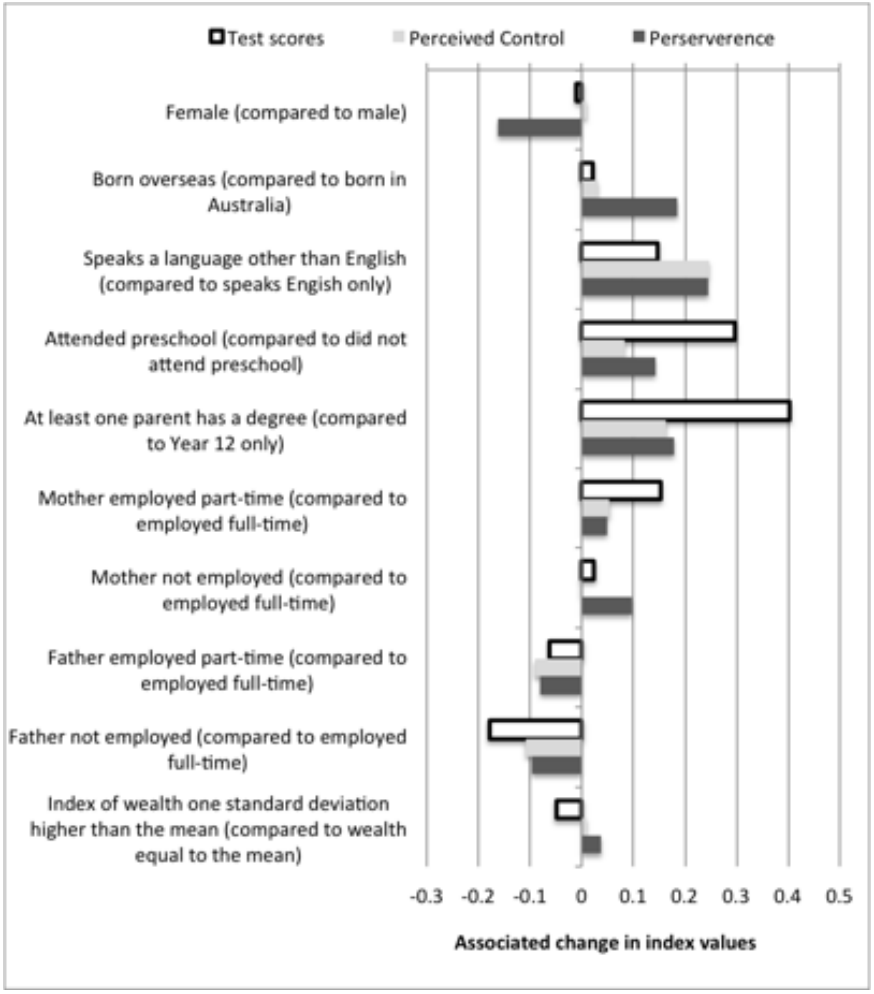
At individual level:

- *r* = .20 for PISA achievement and perceived control/self-confidence
- *r* = .05 for PISA test scores and perseverance/grit

At country level:

- *r* = -.17 for PISA achievement and perceived control/self-confidence
- *r* = -.51 PISA achievement and perseverance/grit


Standardised index values
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
Test scores
Perceived Control
Perserverence
Australia
Canada
Ireland
New Zealand
UK (excluding Scotland)
Scotland
United States of America


Test scores
Perceived Control
Perserverence
Female (compared to male)
Born overseas (compared to born in Australia)
Speaks a language other than English (compared to speaks Engish only)
Attended preschool (compared to did not attend preschool)
At least one parent has a degree (compared to Year 12 only)
Mother employed part-time (compared to employed full-time)
Mother not employed (compared to employed full-time)
Father employed part-time (compared to employed full-time)
Father not employed (compared to employed full-time)
Index of wealth one standard deviation higher than the mean (compared to wealth equal to the mean)
-0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4 0.5
Associated change in index values

- PISA also assesses cognitive, emotional, and behavioural engagement
  - Australian students slightly below OECD average on each of these
  - Correlations with math achievement stronger than OECD average, r = .26 cf. r = .06

Lamb, S., Jackson, J., Walstab, A., & Huo, S. (2015). *Educational opportunity in Australia 2015: Who succeeds and who misses out.* Centre for International Research on Education Systems. Mitchell Institute, Victoria University: Melbourne Australia. www.mitchellinstitute.org.au c

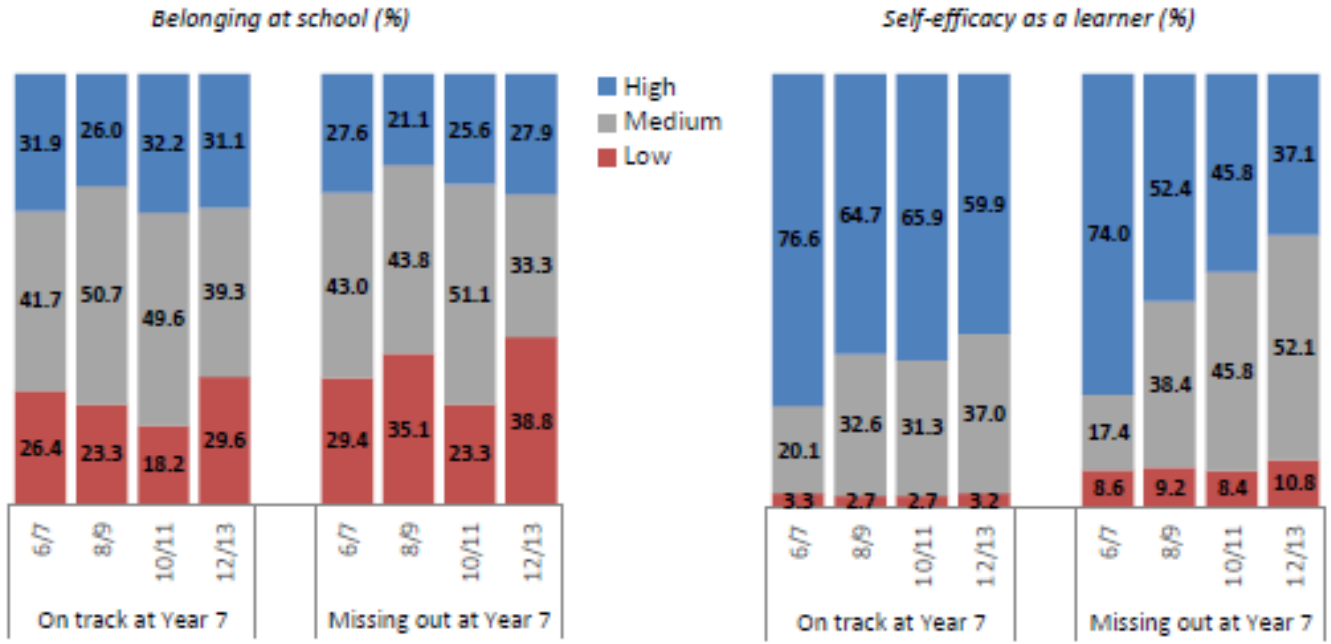
- Similar findings for sense of belonging and purpose
  - Australia lower than OECD average
  - But stronger correlations with composite achievement
    - e.g., purpose *r* =.26 Australia cf. *r* = .04 OECD

Non-cognitive Skills: Not all equal predictors

- Lamb et al. (2015) integrated data from Longitudinal Study of Australian Children (LSAC) with NAPLAN results
- Development in engagement, wellbeing, and other non-cognitive skills such as persistence, conscientiousness, and self-efficacy as a learner important in middle years
  - E.g., declining self-efficacy in early and middle years associated with failure to meet Year 7 foundational reading skills (based on NAPLAN)

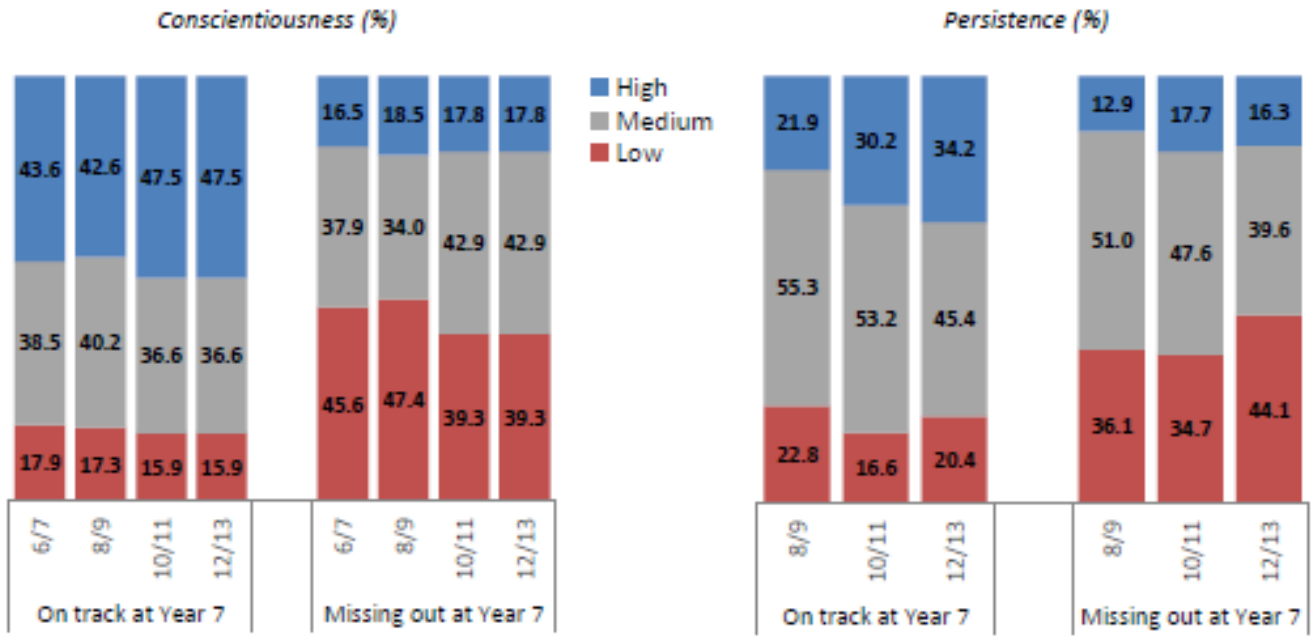
Lamb, S., Jackson, J., Walstab, A., & Huo, S. (2015). *Educational opportunity in Australia 2015: Who succeeds and who misses out.* Centre for International Research on Education Systems. Mitchell Institute, Victoria University: Melbourne Australia. www.mitchellinstitute.org.au c

Figure 2.8 Learner self-reported dispositions over time, by outcome at Year 7 milestone



Source: LSAC K Cohort data.

Figure 2.9 Learner dispositions over time, by outcome at Year 7 milestone

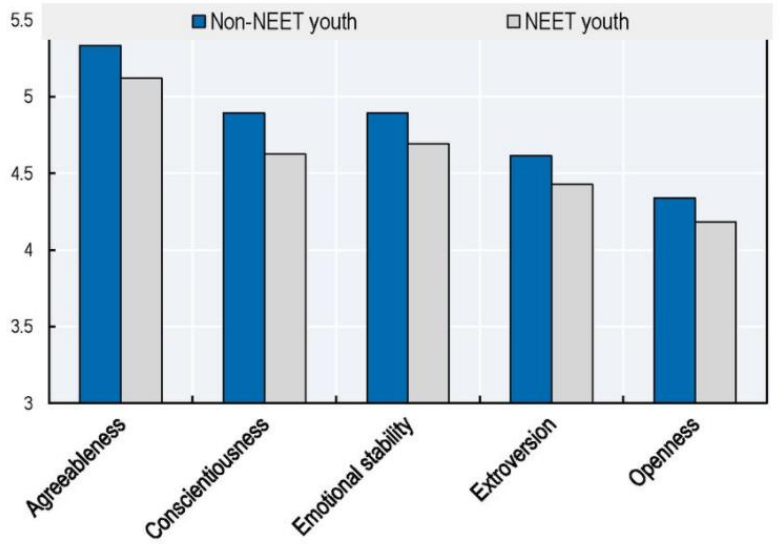


Source: LSAC K Cohort data.

Non-cognitive skills and NEET

- NEET = Not in Education, Employment, or Training

Figure 2.3. Non-NEET youth score higher for non-cognitive abilities than NEETs



Note: The score for each category ranges from 1 to 7 with a higher score in the relevant category indicating that the individual is more, agreeable, conscientious emotionally stable, extroverted or open to experience. Results are based on a set of 36 questions on possible personality traits such as warm, selfish, moody etc. with respondents being asked to place themselves on a scale ranging from 1 ("Does not describe me at all") to 7 ("Describes me very well"). For further details, see Losoncz (2007). A t-test on the differences shows all of them to be statistically significant.

Source: HILDA 2013.