Education in a Changing World

References


1. HUMAN CAPITAL, COGNITIVE AND NON-COGNITIVE SKILLS
1. Human Capital: definition

“Knowledge, skills, competences and other qualities of the individual which facilitate the creation of personal, social and economic wealth” (Oecd 2001).
1. Human Capital: what is about?

Assessed using methods that calculate the relationship between:

- increase of **the cognitive skills** by means of investment in **education, training, work experiences**

and

- **increase of productivity measured** by the increase of earnings over one’s life cycle
1. Human Capital and Cognitive Skills (NCS)

N.B.

Cognitive skills:
intellectual abilities as measured by IQ tests and cognitive tests
1. Human Capital: impact

The Chicago School in the early 1960s found a scientific justification for two beliefs:

- The education level of the individual increases his employment opportunities and his salary
- The overall level of human capital influences the growth and the development of a country

(Mincer, 1958,1961; Schultz, 1961; Becker, 1962,1964)
1. Human Capital and Growth

The Economics of International Differences in Educational Achievement
2. American Education, CS, achievement test

An individual’s skills are reduced to the CS ones measurable with selected-response achievement (standardized) tests

Reasons:

✓ 1960s: more egalitarian society, with vertical mobility in education measuring knowledge by means of easily certified tools

✓ Willing for assessing knowledge in a neutral way
2. American Education, CS, achievement test

... 

✓ no religious influence

✓ Belief that a school should **maximize** its **efficiency** (Tayloristic factory methods) to educate the masses (John Dewey functionalism)

✓ **Cognitive psychology**: knowledge is a mechanism
2. American Education: James Heckman’s critique


- Learning transformed in **superficial** and **only supposed** neutral knowledge
- **Illusion** of eliminating **discriminations**
- **Knowledge flattened** to only one of its elements
- This appears to be disastrous for **the American school**
Human capital results from the combination of two types of skills:

- Cognitive skills: intellectual abilities as measured by IQ tests and cognitive tests
- Non-cognitive skills: soft skills or character skills
## 3. Non-Cognitive Skills (NCS)

<table>
<thead>
<tr>
<th>Personality Factors</th>
<th>Facets</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTRAVERSION</td>
<td>Dynamism, Dominance</td>
<td>Fluency, social vitality, enthusiasm \ Ability to impose oneself, to excel, to assert one’s own influence</td>
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<tr>
<td>AGREEABLENESS</td>
<td>Cooperation/Empathy, Warmth/Friendliness</td>
<td>Ability to understand and meet the needs of others, ability of cooperating with others, Reliability, trust, openness towards others</td>
</tr>
<tr>
<td>CONSCIENTIOUSNESS</td>
<td>Scrupulosity, Perseverance</td>
<td>Care, dutifulness, order, attention to details \ Pertinacity, tenacity, reliability (honoring commitments)</td>
</tr>
<tr>
<td>NEUROTICISM</td>
<td>Emotional stability, Consistency in emotional reactions</td>
<td>Control of the anxiety connected to emotional experiences \ Control over behavior (even in situations of uneasiness, conflict and danger)</td>
</tr>
<tr>
<td>OPENNESS TO EXPERIENCE</td>
<td>...to culture, ...to experience</td>
<td>Interest in staying informed, reading, acquiring knowledge \ Positive attitude towards novelty, ability to consider multiple perspectives, positive openness to different styles, ways of life and cultures</td>
</tr>
</tbody>
</table>

American Society of Psychology
4. CS, NCS and Scholastic Knowledge

One group of students with equal CS but with different NCS (top quartile red; Bottom quartile blue)

Figure 1c. Math test-score gains between 4th and 8th grade, by non-cognitive skill quartile

[West, 2014]
4. CS, NCS and Scholastic Knowledge

Panel D. United States

Probability of self-reported college completion by skill deciles

4. CS, NCS and Attitude Towards Life: Depression

The higher one’s self-esteem, the higher the impact of cognitive skills on decreasing the probability of depression.

Source: OECD (2015)
4. CS, NCS and Attitude Towards Life: Positivity

Panel B. **New Zealand**

Probability of being very happy at age 20, based on self-reports, by skill deciles

Source: OECD (2015)
NCS are also predictors of:

- Scholastic performance
- Work performance
- Not taking part in illegal activities
- Longevity
5. Why NCS in modern world

Until 1950s-1960s: industrialization, Fordist model, mechanized assembly lines

Technological obsolescence: 40 years

Technical and undifferentiated education
Today

Mechanized and interconnected industrial production

Obsolescence within 5 years

Continuous change

Industry 4.0
5. Why NCS in modern world

Room for activities requiring:

- **Flexibility, creativity, problem-solving skills**  
  (Autor et al. 2003)

- **Judgment** and common sense (Autor 2015)

- **Interaction** skills (Deming 2015)

Cognitive skills and “standardized” education are not enough

Character skills are important as well
2. WHAT HECKMAN SUGGESTS FOR EDUCATION
1. NCS in Education (Heckman)

1) The achievement tests are not able to capture all skills

2) CS are not enough to explain educational and work outcomes

3) Teaching standardization loses sight of the growth of the person and does not prepare for work and for adult life

4) We should overcome the current functionalism of education

The school should not limit itself to the acquisition of knowledge, but it should represent a significant connected with the meaning of life
2. Heckman’s Character: Improvement

Character is a mix of dispositions, such as intelligence, will, behaviors (conscientiousness, emotional stability, openness, etc.)

*Character* improvement is possible when young people:

1. Are in contact with adults who accompany them not by saying “do as I tell you”, but “do with me”

2. Are helped to form a critical sensibility, not just a repetitive sensibility
3. Heckman’s *Character*: Improvement

3) are immersed in authentic work environments where they can test themselves

4) are opened both to knowledge and to social and cultural experiences

5) are fostered to some non-cognitive attitudes that influence the quality of life at an early age.
3. A SCHOOL FOR CHARACTER
1. Determining Factors for a Good School: Spending?

Source: Hanushek Woessmann (2011)
2. Determining Factors for a Good School: Spending?

Resources invested in education have a (positive) impact up to $40,000 per student.

Beyond this threshold, no significant results are observed.

Hence:

Spending $50,000 (New Zealand), almost $100,000 (Italy) or $200,000 (Luxembourg) does not seem to entail any difference from the point of view of student learning.
3. Policy for an Education Fostering CS-NCS

- Educational paths with learning levels significantly higher than educational systems state-run and centralized:
  - personalized teaching
  - autonomy (programs, teacher hiring decisions and salaries, budget)
  - parity (significant public resources)

- Extracurricular work experiences

- Social and cultural experiences

- Interactions with parents (Non invasive with teaching)
4. Determining Factors for a Good School: Autonomy

School autonomy over teacher choice and salaries

Source: Hanushek Woessmann (2011)
5. Determining Factors for a Good School: Autonomy

Source: Hanushek Woessmann (2011)
6. Determining Factors for a Good School: Autonomy

School autonomy in deciding on budget allocations within school

Math test score

Central exams

Source: Hanushek Woessmann (2011)
7. Determining Factors for a Good School: Parity

Source: Hanushek & Woessman (2011)

Competition and role of the private sector
8. Conclusions

- Improving NCS isn’t a new technique
- CS, NCS, character grow through an educational experience
- Education as an introduction to reality to discover its meaning and to growth in self-awareness
- The educational experience is the unpredictable human encounter between teacher and students