Informal learning and development of *key competences* in workplaces.

Prof. Riccardo Leoni (Ph.D.)
Department of Economics
University of Bergamo (Italy)

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Introduction/1

- Where do we learn? Nobel prize Heckman (2000): "*much learning takes places outside of schools: post-school learning is an important source of skill formation that accounts for as much as one third to one half of all skill formation in a modern economy*
  (estimate in Heckman, Lochner e Taber, 1998)

Introduction/2

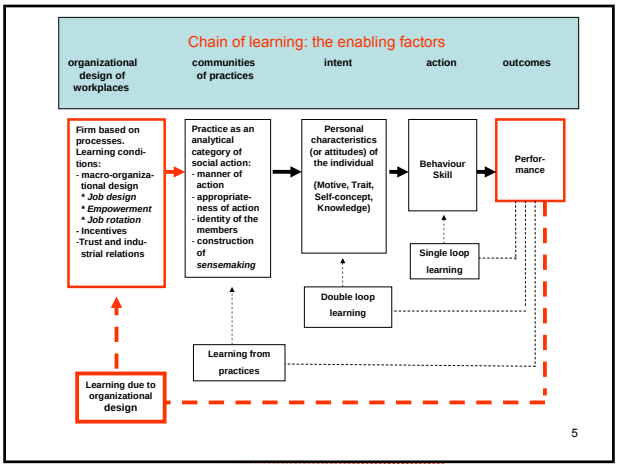
- Heckman (2000, p.5): Because much of this learning takes place in informal settings outside of educational institutions, it gets neglected by educational institutions and the politicians who equate skill formation with classroom learning
- Three questions:
  - Outside school, where?
  - by which means and?
  - what kind of competences we learn outside the school system?

At the level of workplace, the economic literature *stress*:

– *learning-by-doing (*Arrow, 1962)
– *learning-by-using* (Rosenberg, 1982)
– *learning-by-interacting* (Lundvall, 1988)
– *learning-by-searching* (Cohen-Levinthal, 1990)

New contribution:

Bartel *et al.* (2004) give evidence of "w*orkplace attitudes within firm"*, ascribable to: *Style of management*, *or Work practices*



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What kind of competences can we learn at workplaces?

- COMPETENCES:
  - **Professional/craft (skill?)** — Technico-specialism?
  - **Non-professional/craft**
    - Cognitive competences:
      - Problem solving
      - Relationship
      - Teamworking

      → Key or core or strategic competences or cognitive meta-competences or transversal competences
    - Non-cognitive competences:
      - Self-confidence
      - Self-control
      - …..

Core of the paper

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Aim of the paper

theoretical model

$$ICE_{it} = \theta_1 SCH_{it} + \theta_2 WBL_{it} + \theta_3 Z_i + u_{it}$$

for t = 1, ..n

where:

- ICE = Index of Competences Expressed by an individual worker occupying a position i at time t;
- SCH= vector of schooling;
- WBL = vector of index of work-base learning;
- Z = vector of firm's organizational characteristics
- u = stochastic term

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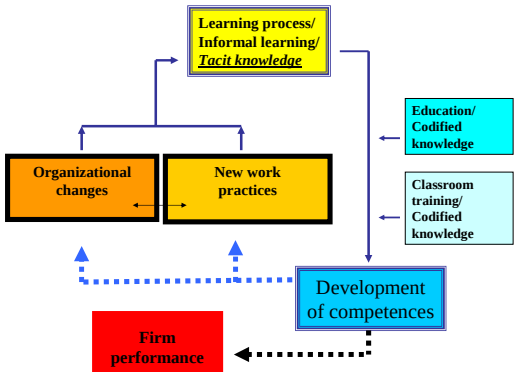

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To skip

Empirical model
(very similar to Green et al., 2001, OEP)

$$ICE_{it} = \alpha_0 + \alpha_1 G_{it} + \alpha_2 ES_{it} + \alpha_3 TC_{it} + \alpha_4 PT_{it} + \alpha_5 SCH_{it} + \alpha_6 SCH_{it}^2 + \alpha_7 WEXP_{it} + \alpha_8 WEXP_{it}^2 + \alpha_9 SCH_{it} * WEXP_{it} + \alpha_{10} HLT_{it} + \alpha_{11} LLT_{it} + \alpha_{12} TR\_CE_{it} + \alpha_{13} TR\_PE_{it} + \alpha_{14} TE + \alpha_{15} QC_{it} + \alpha_{16} SS_{it} + \alpha_{17} APP_{it} + \alpha_{18} INF_{it} + \alpha_{19} CONS_{it}$$

Expected signs

$$\alpha_{1,F} > 0,\ \alpha_2 \gtrless 0,\ \alpha_3 < 0,\ \alpha_4 < 0,$$
$$\alpha_5 > 0,\ \alpha_6 < 0,\ \alpha_7 > 0,\ \alpha_8 < 0,\ \alpha_9 > 0$$
$$\alpha_{10} > 0,\ \alpha_{11} < 0,\ \alpha_{12} > 0,\ \alpha_{13} = 0,\ +\alpha_{14} > 0$$
$$\alpha_{15} > 0,\ \alpha_{16} > 0,\ \alpha_{17} > 0,\ \alpha_{18} > 0,\ \alpha_{19} > 0$$

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Data base

- **Survey carried out by ISFOL (2004), through a CAPI interview to a stratified sample of 3605 employees, representing a population of 9,200 million of employees of the private sector (agricultural and building sectors excluded)**
- **Questionnaire contains:**
  - **a section recording the frequency of organizational competences carried out in an efficient manner by the respondent.**
  - **More than 200 variables**

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Eventually
To skip

Way of measuring the level of competences

- **List of 14 (out of 44) organizational behaviours, self-reported by 3.400~ individual workers**
- **Use of confirmative Factor Analysis to extract 'common factor' to be retained**
- **The 'crude' factors have to be rotated**
- **Underline conceptual constructs has been identified**
- **ICE$_i$ for competence j has been constructed:**

$$ICE_i^j = a_1^j X_{i,1} + a_2^j X_{i,2} + ... + a_n^j X_{i,n}$$

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Depend. Variable: ICE as level of competences expressed (or acted) measured by **factor analysis**

- Competences refer to:
  - **Problem solving**
  - **Team working**
  - **Communication with clients**
  - **Communication with collaborators**
  - **(TOTAL KEY COMPETENCES: weighted sum of the four listed competences)**

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Controls in the estimated model :

- Gender (M/F)
- Establishment size
- Temporary / open-ended contracts
- Part time/full time
- Schooling (number of years in schools)
- Work experienced (number of years)
- Learning time – HLT and LLT (categorical var.)
- Training – CE and PE (0/1)
- Tenure (years)

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CORE VARIABLES

- ICE_j (level of competences expressed) **depends** - *ceteris paribus* – on:
  - **Quality circle (i.e. to be member of groups of improvements)**
  - **Suggestion system (have submitted, with economic reward, suggestions in a given period)**
  - **Information (have received a certain amount of information, in a given period)**
  - **Consultation (have been consulted by superiors a certain number of time, in a given period)**
  - **Appraisal (have been periodically appraised)**
  - **Increase in discretionary power**

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Main results

In the following slides
– for the sake of space and time –
the econometric results refer to
TOTAL KEY COMPETENCIES

(for single competencies
see: Leoni and Gaj, 2009)

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Table 1 - Dependent variable: index of total key competences
Weighted OLS estimates, with heteroscedasticity-robust standard error.
Levels of confidence: *** = 1%, ** = 5%, * = 10%

	Mod-1		Mod-2		Mod-3		Mod-4	
Indip. Var.	Coeff. (s.e.)	l.o.c.	Coeff. (s.e.)	l.o.c.	Coeff. (s.e.)	l.o.c.	Coeff. (s.e.)	l.o.c
Control variables:	Yes		Yes		Yes		Yes	
Quality circle							**2.690 (.933)**	***
Suggestion system							**4.275 (.548)**	***
Appraisal							**2.109 (.680)**	***
Information							**2.171 (1.119)**	**
Consultation							**2.352 (3.116)**	***
Constant	7.691 (2.588)	***	7.519 (3.166)	**	10.239 (3.182)	***	8.160 (3.116)	***

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Table 2 - Dependent variable: index of competence 'TOTAL KEY COMPETENCES'
Weighted OLS estimates, with heteroskedasticity-robust standard error. Levels of confidence: *** = 1%, ** = 5%, * = 10%

	Model_5		Model_6	
Indip. variables	**Coefficients (s.e.)**	**l.o.c.**	**Coefficients (s.e.)**	**l.o.c.**
Control variables:	Yes		Yes	
Quality circle (time t)	**2.495 (.993)**	***		
***Quality circle* (yes, *time t & t-5*)**			**0.946 (1.482)**	
***Quality circle* (*yes time t; no t-5*)**			**3.916 (1.082)**	***
Suggestion system	**4.612 (.588)**	***	**4.480 (.587)**	***
Appraisal (time t)	**1.991 (.730)**	***		
***Appraisal* (yes, *time t & t-5*)**			**2.125 (.890)**	**
***Appraisal* (*yes time t; no t-5*)**			**1.588 (1.131)**	
Information	**1.441 (1.177)**		**1.243 (1.186)**	
Consultation	**2.372 (.697)**	***	**2.326 (.710)**	***
Increase in discretionary power (between t-5 and t)			**1.263 (.728)**	*
constant	8.346 (3.686)	**	7.824 (.3773)	**

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To skip

Three problems
(faced in Leoni and Gaj, 2009)

- Endogeneity:
  - Organizational characteristics *versus* personality traits (we control for 4 personality traits – i.e. individual fixed effects – and 2 of them come out statistically significant)
  - tenure (instrumented: TSLQ)
- Selectivity: argued
- Heteroskedasticity: controlled by Robust Standard Error

No one of these problems undermine the acquired results here documented.

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Conclusions and Policy implications/1

1. **Heckman (2000, p.5): "One we recognize the importance of informal sources of learning for skill formation, we think about policies to foster skill in a different way".**
2. **Which policy?**
   A firm redesign (like BPR), which allow to make explicit a consistent informal learning (efficient, costless and evolving)
3. **How?**
   Contracts at firm level – between the social parties (managers and trade union) – in order to introduce and stimulate (with economic incentive to compensate for learning) organizational changes (i.e. to redesign workplaces, in line with the 'lean production' model)
4. **Role of Economic Policy?**
   Supply fiscal incentives in order to reduce costs of undertaking Business Process Engineering (BPR), which are costly, provided the exixtence of an agreement with workers' representatives

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Conclusions and Policy implications/2

4. **By the way, such a policy have already been implemented in some Northern European countries, following indications of the EU-Green paper "Partnership for a new work organization" (1997), riasserted by EU-1998 and EU-2000.**

FLEXIBLE WORKPLACES
rather than
FLEXIBLE EMPLOYMENT CONTRACTS

"LEARNING IS THE NEW WAY OF WORKING"
(Zuboff, 1988)

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