

Organisational Learning, Innovation and Systems of Education and Training: A Regional Perspective

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Innovation and Learning in
Enterprises

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A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, extending from the right edge towards the center.

Objectives

- Develop a mapping of forms of work organisation and learning for the regions of a sample of European nations.
 - Make a case for the positive relation between learning and innovation performance
 - Examine the links between learning and regional systems of education and training
 - Consider how access to creative work environments for persons with different levels of initial education is influenced by the system of life-long learning
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Key references

- E. Lorenz and B-A. Lundvall, “Measuring Creativity in the European Union”, in E. Villalba (ed.) *Can Creativity be Measured?*, EUR Report, Directorate General Education and Culture, 2009.
 - Greenan, N. and E. Lorenz, “Innovative Workplaces: Making better use of skills within organisations”, OECD, 2010.
 - E. Lorenz. “Regional Learning Dynamics and Systems of Education and Training: A European comparison”, *Journal of the Knowledge Economy*, December, 2011
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Data source: data on persons in employment

- Fourth European Working Conditions Survey (2005) for the employee-level data on work organisation and learning.
 - Persons in employment working in all sectors including the public sector
 - Analysis is restricted to Norway and 17 of the 27 members nations of the EU
 - 81 regions at the NUTS 1 or NUTS 2 levels: (17,412 observations)
- Eurostat's electronic data base for regional indicators of education and training.

Number of regions by nation

18 Nations	81 Regions
Belgium	3 (NUTS1)
Czech Republic	8 (NUTS2)
Greece	4 (NUTS1)
Spain	7 (NUTS1)
France	8 (NUTS1)
Ireland	2 (NUTS2)
Italy	4 (NUTS1)
Hungary	3 (NUTS1)
Netherlands	4 (NUTS1)
Austria	3 (NUTS1)
Poland	6 (NUTS1)
Portugal	5 (NUTS2)
Slovakia	4 (NUTS2)
Finland	3 (NUTS3)
Sweden	3 (NUTS1)
Bulgaria	2 (NUTS1)
Romania	4 (NUTS1)
Norway	7 (NUTS2)

Table 3: Variables for types of learning: 81 European regions

	Percent of salaried employees affected
Problem solving activities	81.0
Learning new things in work	69.1
Using one's own ideas in work	58.2
Undertaking complex tasks	55.5
Discretion in fixing work methods	64.5
Discretion in setting work pace	68.6
Repetitiveness of tasks	36.9
<i>n</i>	<i>17,412</i>

Source: Fourth Working Conditions survey, European Foundation for the Improvement of Living and Working Conditions

Table 4: Learning Clusters: 81 European regions

Variable	Creative learning	Constrained learning	Low learning	Average
Problem solving activities	95.5	88.6	40.5	81.0
Learning new things in work	85.4	86.8	15.2	69.1
Complexity of tasks	68.2	76.9	5.9	58.2
Using one's own ideas	81.3	35.9	26.1	55.5
Discretion in fixing work methods	96.3	19.9	33.5	64.5
Discretion in setting work rate	95.0	30.1	44.4	68.6
Repetitiveness of tasks	30.5	50.0	39.3	36.9
Total share of employees	54.2	22.9	23.9	100.0

Source: Fourth Working Conditions Survey, European Foundation for the Improvement of Living and Working Conditions

Table 5: Types of Learning by Sector of Activity: 81 European regions

	Percent of salaried employees by sector of activity and type of learning			
	Creative learning	Constrained learning	Low learning	Total
Agriculture, forestry, fishing	61.0	12.2	26.8	100
Manufacturing, construction and utilities	46.0	27.0	27.0	100
Retail and other services	48.5	21.9	39.6	100
Business and financial services	65.1	19.6	15.3	100
Public administration, education, and health and social work	62.8	21.9	15.3	100
Community, social and personal services	59.7	17.8	22.5	100
Average	54.2	22.9	23.9	100

Source: Fourth Working Condition survey. European Foundation for the Improvement of Living and Working Conditions

Table 6: Types of Learning by Occupation: 81European regions

	Percent of salaried employees by occupation and type of learning			
	Creative learning	Constrained learning	Low learning	Total
Managers and senior officials	75.7	12.3	12.0	100
Professionals	76.5	16.1	7.4	100
Technicians	64.7	25.2	10.1	100
Clerks	51.0	25.4	23.6	100
Sales and service	51.3	22.3	25.4	100
Craft and related trades	50.7	24.2	25.1	100
Plant and machine operators	28.0	28.9	43.1	100
Elementary occupations	34.8	21.4	43.8	100
Average	54.2	22.9	23.9	100

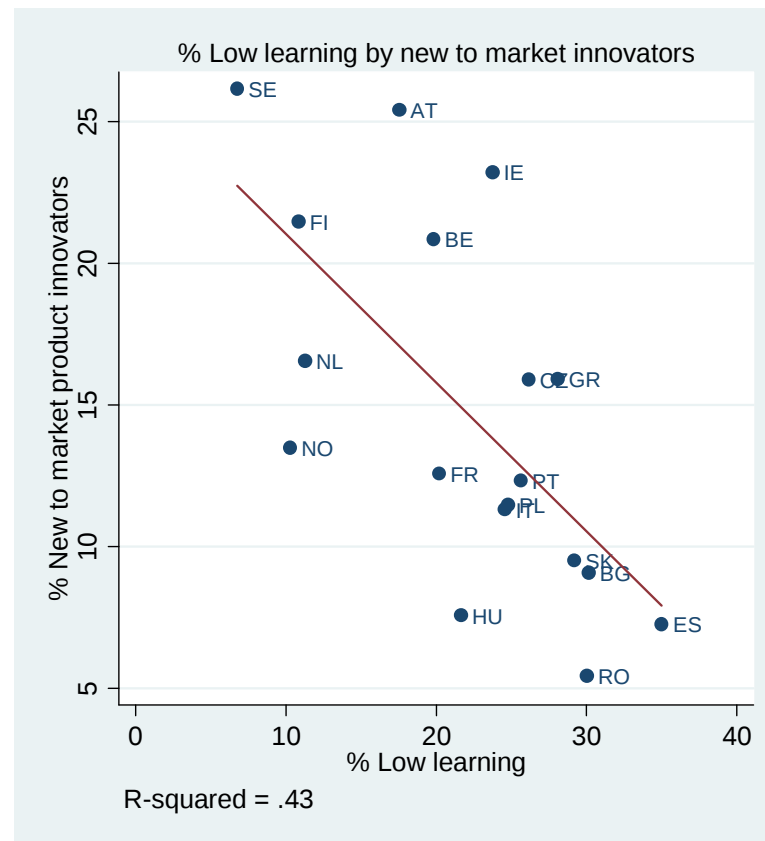
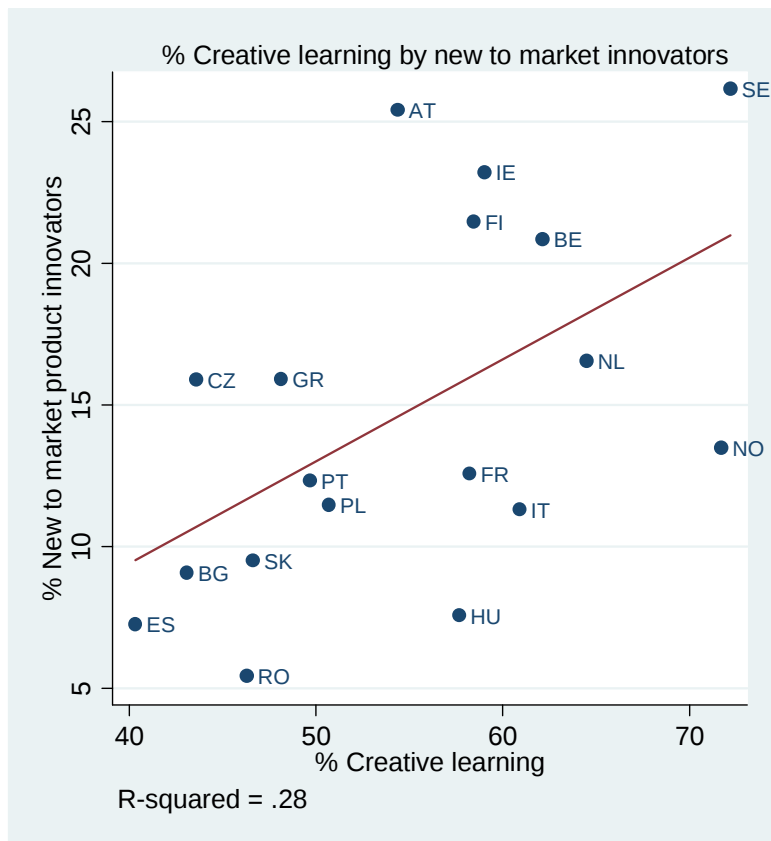
Source: Fourth Working Condition survey. European Foundation for the Improvement of Living and Working Conditions

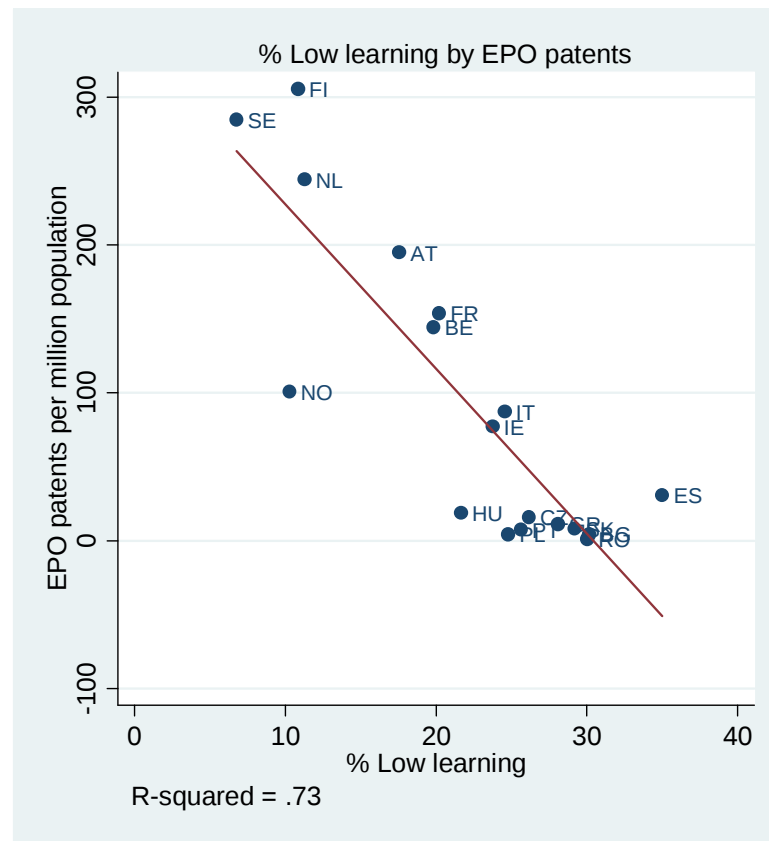
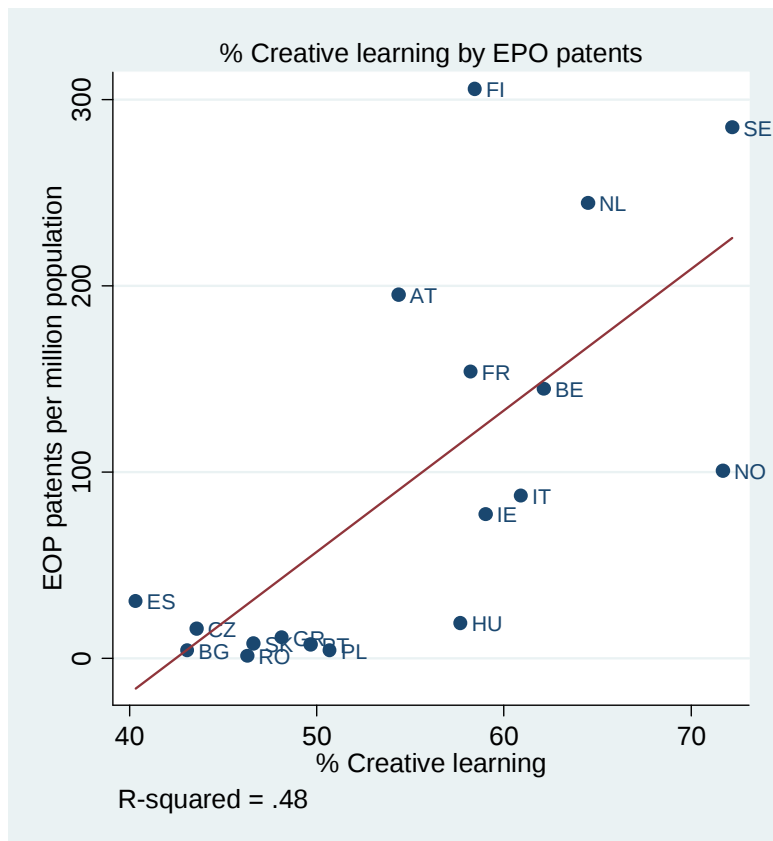
Table 7: Differences between countries in types of learning: 2005
(weighted percent of employees by learning class)

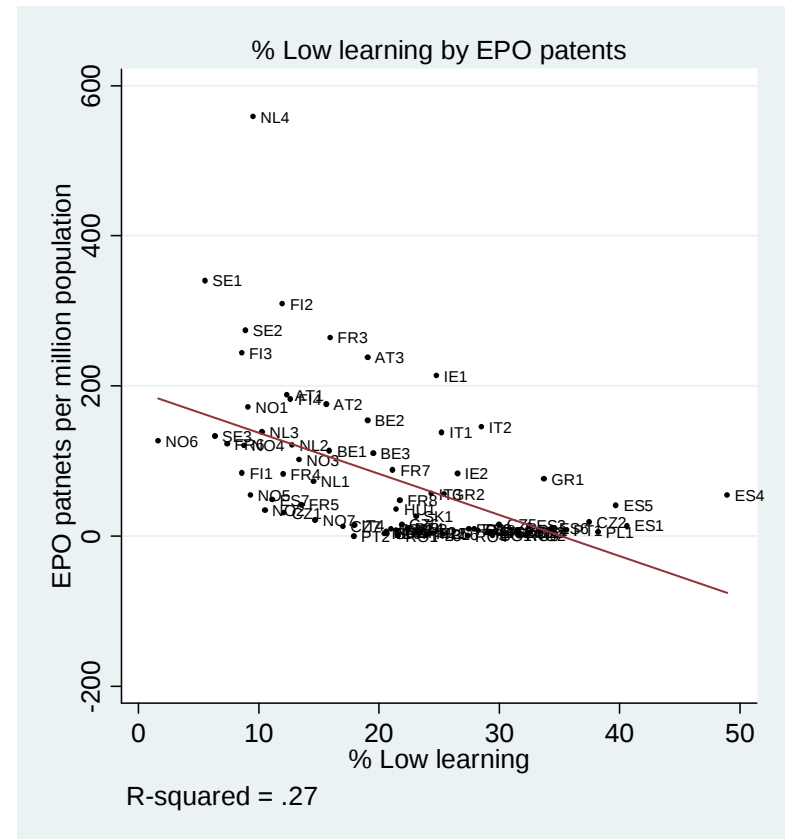
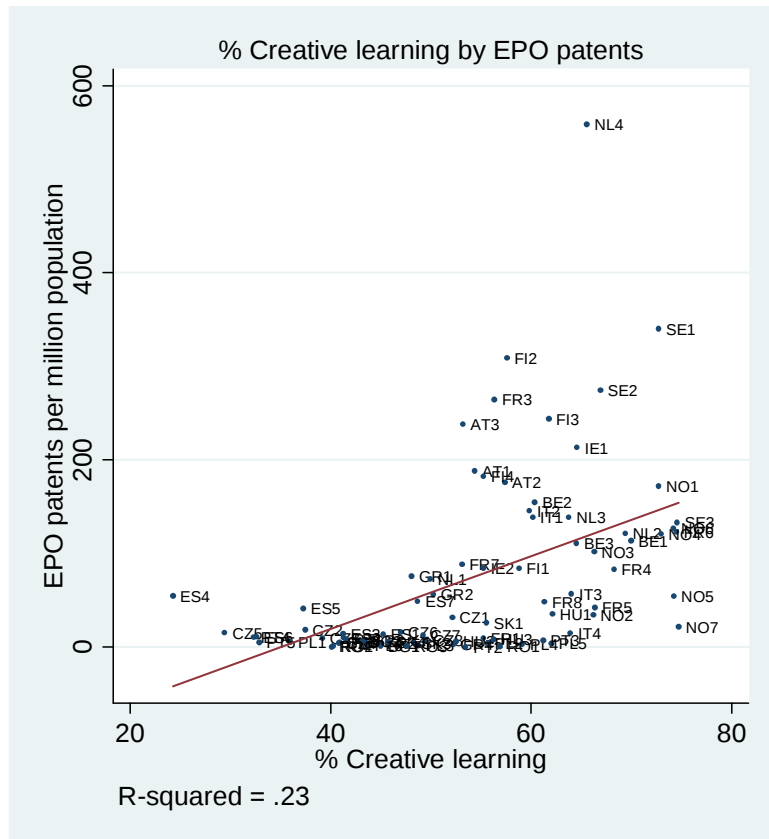
	Creative learning	Constrained learning	Low learning	Total
Belgium	62.12	18.05	19.84	100
Czech Republic	43.59	30.24	26.16	100
Greece	48.14	23.79	28.07	100
Spain	40.32	24.67	35.01	100
France	58.22	21.58	20.20	100
Ireland	59.02	17.22	23.76	100
Italy	60.91	14.54	24.54	100
Hungary	57.67	20.69	21.64	100
Netherlands	64.50	24.24	11.26	100
Austria	54.36	28.09	17.55	100
Poland	50.69	24.54	24.77	100
Portugal	49.66	24.70	25.64	100
Slovakia	46.62	24.19	29.19	100
Finland	58.45	30.70	10.84	100
Sweden	71.08	21.52	7.40	100
Bulgaria	43.08	26.78	30.15	100
Romania	46.29	23.69	30.02	100
Norway	71.71	18.01	10.28	100
Average for 18 nations	54.2	22.9	23.9	100

Table 8: Types of Learning by Region: 81 European regions

	Percent of salaried employees by region and type of learning			
	Creative learning	Constrained learning	Low learning	Total
10 regions with the highest frequency of creative learning				
Trøndelag, Norway	75.05	22.66	2.29	100
NorraSverige, Sweden	73.91	19	7.09	100
Oslo og Akershus, Norway	73.58	16.33	10.1	100
Vestlandet, Norway	73.55	17.24	9.21	100
Sud-Ouest, France	73.1	18.1	8.8	100
Agder og Rogaland, Norway	72.46	18.83	8.71	100
Nord-Norge, Norway	72.13	12.46	15.41	100
Östra Sverige, Sweden	72	22.13	5.86	100
Oost-Nederland, Netherlands	69.73	18.47	11.81	100
Södra Sverige, Sweden	69.45	22.49	8.06	100
10 regions with the highest frequency of constrained learning				
Lisboa, Portugal	32.63	41.93	25.43	100
Jihozápad, Czech Republic	40.84	39.87	19.29	100
Alentejo, Portugal	32.54	39.79	27.67	100
Canarias, Spain	51.72	35.86	12.42	100
Praha, Czech republic	51.28	35.38	13.34	100
Ostösterreich, Austria	50.49	35.18	14.33	100
Severovýchod, Czech Republic	32.24	34.97	32.8	100
Sur, Spain	35.43	32.99	31.58	100
Itä Suomi, Finland	58.69	32.46	8.85	100
Pohjois-Suomi, Finland	55.91	32.43	11.66	100
10 regions with the highest frequency of low learning				
Centro, Spain	29.98	20.2	49.83	100
Noroeste, Spain	44.6	13.7	41.71	100
Este, Spain	39.59	22.25	38.16	100
Macroregiunea doi, Romania	39	23.09	37.91	100
Norte, Portugal	41.55	23.72	34.73	100
Strední Čechy, Czech Republic	38.49	26.83	34.68	100
Centralny, Poland	41.05	24.62	34.33	100
Macroregiunea trei, Romania	46.33	20.83	32.84	100
Severovýchod, Czech Republic	32.24	34.97	32.8	100
Severozápad, Czech Republic	39.77	27.69	32.54	100







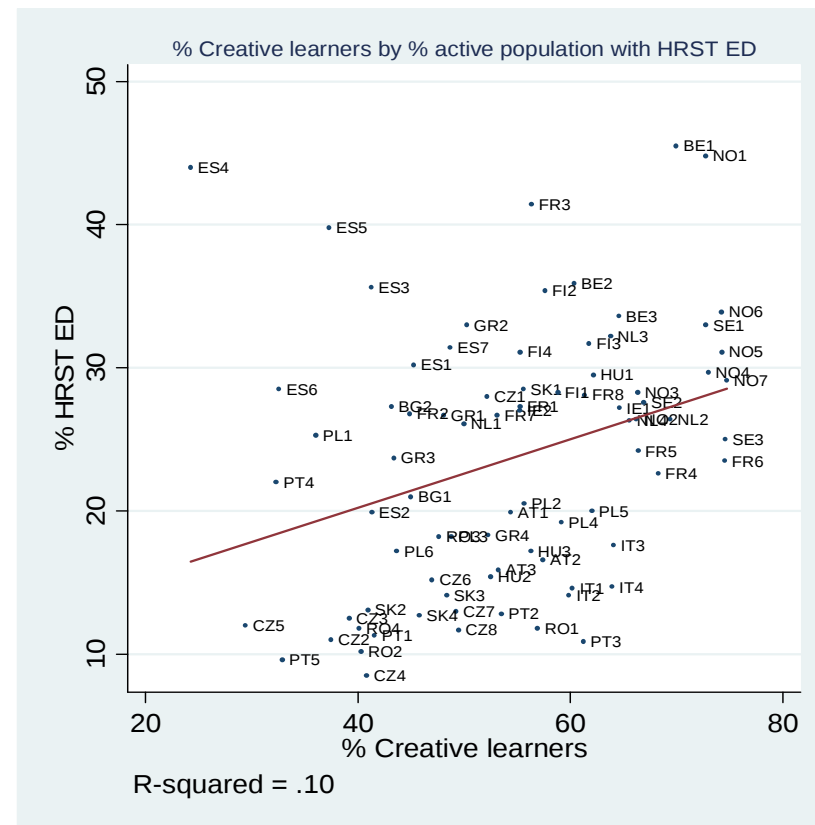
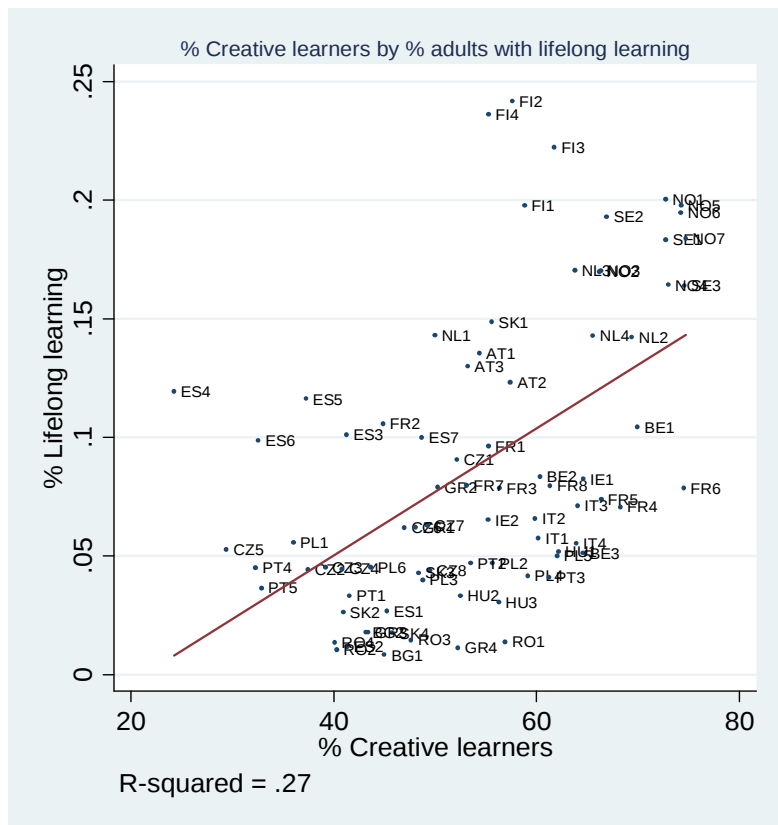
Indicators of Education and Training System

- Life-long-learning. The percentage of adults aged 25-64 involved in education or training during the four weeks prior to the survey.
 - Broad measure of LLL including formal, non-formal and informal or self-learning.
 - Human resources for science and technology – education (HRST-ED). Percent of the active population having successfully completed a third-level education.
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Table 9: Regional Education and Training Indicators

High LLL Regions		High HRST ED Regions	
Etelä-Suomi, Finland	24.2%	Région de Bruxelles, Belgium :	45.5%
Pohjois-Suomi, Finland:	23.6	Oslo og Akershus, Norway :	44.8
Länsi-Suomi, Finland :	22.2	Centro , Spain :	44.0
Oslo og Akershus, Norway:	20.0	Nord - Pas-de-Calais, France :	41.4
Itä-Suomi, Finland:	19.8	Este, Spain:	39.8
Vestlandet, Norway :	19.8	Vlaams Gewest, Belgium:	35.9
Trondelag, Norway :	19 .5	Comunidad de Madrid, Spain:	35.6
Södra Sverige, Sweden :	19.3	Etelä-Suomi, Finland:	35.4
Nord-Norge, Norway :	18.4	Trøndelag, Norway:	33.9
Östra Sverige, Sweden :	18.3	Région Wallonne, Belgium:	33.6
Low LLL Regions		Low HRST ED Regions	
Severna I iztočna, Bulgaria:	0.1%	Severozápad, Czech Republic:	8.5%
Macroregiunea do, Romania:	1.1	Alentejo, Portugal:	9.6
Nisia Aigaiou, Kriti, Greece	1.1	Macroregiunea do, Romania:	10.2
Noreste, Spain:	1.2	Centro , Portugal:	10.9
Macroregiunea patru, Romania:	1.4	Střední Čechy, Czech Republic	11.0
Macroregiunea uno: Romania:	1.4	Norte, Portugal:	11.3
Macroregiunea tre: Romania	1.5	Moravskoslezsko, Czech Republic:	11.7
Východné Slovensko, Slovakia:	1.8	Macroregiunea unu, Romania:	11.8
Attiki, Greece:	1.8	Macroregiunea patru, Romania:	11.8
Yugozapadnai yuzhna centralna Bulgaria:	1.8	Severovýchod, Czech Republic:	12.0

Eurostat's regional data set



Use of regression modeling to extend the analysis

- The econometric results confirm that there is a positive relation between the percent of the regional population involved in LLL and the frequency of creative work activity.
- The results also show that after controlling for the level of LLL the positive effects of increasing the percent of the active population with a third-level education drop nearly to 0 and become statistically insignificant.

Limits of third-level education

- No robust evidence to support view that increasing alone the proportion of the population with a formal third-level education will automatically translate into higher levels of learning at the establishment level.
 - Formal academic knowledge acquired through initial third-level education needs to be complemented by investments in both formal and non-formal forms of further education and training, including work-related training provided by employers
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Interactions between regional systems of LLL and the employee's level of initial education

- Multi-level modeling shows that in all regions employees with a third-level education have a better chance than those with lower levels of initial education of gaining access to the existing stock of creative work activity.
- However, in regions with well developed systems of LLL the relative chances of employees with only a secondary education of gaining access to creative work activity are improved.

The value of systems of lifelong learning

- Systems of LLL are important complements to formal initial education because they contribute to renewing and further developing the practical and work-related skills needed for solving the organisational and technical problems employees confront in work.
- They also can have an important equalizing effect by improving the relative chances of persons with only secondary education of gaining access to creative work environments.

Policy implications

- In many regions there is a need for a better balance between investments in initial formal education and investments creating opportunities for further education and training over the career.
 - Well developed systems of life-long learning which include both formal and non-formal further education and training would appear to compensate to some degree for a relatively small stock of persons with a third-level education. However, increasing the stock of persons with formal third-level initial education cannot compensate for the lack of further training contributing to the renewal and further development of the skills and knowledge needed to solve the organizational and technical problems employees confront in work.
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