

# **Les universités européennes sont-elles prêtes à affronter les défis des économies fondées sur la connaissance?**

**Jean-Jacques Paul**

**Iredu (Institut de Recherche sur l'Éducation/  
Sociologie et Économie de l'Éducation,  
CNRS/Université de Bourgogne, Dijon, France)**

*Conférence donnée à l'Université Catholique de  
Louvain-la-Neuve*

*3 juin 2003*

# L'Université de Bourgogne



## La Bourgogne





# Quelques données



- **25 000 étudiants en 2002-2003**
- **1400 enseignants**
- **1000 fonctionnaires d'appui**
- **554 diplômes différents dans 22 facultés et instituts**



# Iredu



- **Institut de Recherche sur l'Education:  
Sociologie et Economie de l'Education**
- **30 chercheurs**
- **Lié à l'université de Bourgogne et au CNRS**
- **a 30 ans cette année**

# Main questions

- Do European universities develop the competencies required by knowledge-based economies?
- Why education economists must deal with competencies?
- What are the competencies valued in the labour market?

# Main questions

- Beyond the monetary value of competencies, what are the most required?
- What are the competencies under produced by higher education?
- Do specific modes of teaching and learning have a stronger impact on the production of required competencies?
- Are some countries more ready to face knowledge based economy?

# Macro-economic evolutions

*Since the mid seventies*

- No more stable and permanent growth
- No more predictable demand

*End of the 20th century*

- Strengthening of the knowledge based economy

# How to define the knowledge-based economy ?

Meeting point between

a continuous growth of investments and activities devoted to “knowledge”

a revolution of production techniques and of techniques of knowledge transmission (IT)



# As a consequence of these macro economic evolutions

New organisational models reinforced by the globalisation of the economies, which promotes their diffusion.

Initial training is no more conceived as a preparation to specific occupational slots, but rather to provide workers with the basic tools enabling them to adapt themselves to varying occupational needs.

All these evolutions imply higher education develops new **competencies** linked to

- information technologies
- but above all enabling graduates to evolve in a changing world.

This modern conception of education leads to a new vision of the traditional human capital models. In this approach, human capital was measured using a rather rough method, by the number of years of education and training (or by the degree) and by the number of years of experience.

The stress on competencies leads to define human capital, no longer by a variable describing a **process**

but by a set of variables describing the **results** of the educational process, i.e. the different competencies acquired by the educated workers

# Which data can be used?

Need for data describing

- the competencies acquired by graduates
- the competencies required by jobs
- the quality of study provision
- the situation regarding the labour market

# The CHEERS project

- Careers after Higher Education: a European Research Survey
- From autumn 1998 to spring 2000: 36,000 graduates from 11 European countries and Japan provided information through a written questionnaire on the relationship between higher education and employment four years after graduation.
- Thirteen research institutions coordinated by Ulrich Teichler (university of Kassel, Germany)

# The typology of competencies

- Graduates asked to state in respect of a list of 36 competencies the extent to which these were required in their current work as well as the extent to which they had acquired these competencies at the time of the graduation.
- The question was “Please, state the extent to which you had the following competencies at the time of graduation and to what extent they are required in your current work”. Scale of answers from 1= ‘To a very high extent’ to 5=’Not at all’

These 36 competencies can be split into three main  
sets : theoretical knowledge, practical knowledge and  
behavioural skills.

Theoretical knowledge involves four competencies  
such as “broad general knowledge”, “field-specific  
theoretical knowledge”.

Practical knowledge is described on the basis of seven  
competencies among those “written communication  
kills”, “foreign-language proficiency”, “computer  
kills”.



Regarding the behavioural skills, two levels have been taken into consideration: the individual level, which refers to the direct link between the worker and the tasks he/she has to perform, and the collective level, which considers the worker as a member of a work organisation.

At the individual level, seventeen competencies are rated, such as : “problem solving ability”, “working under pressure”, “time management”, “fitness for work”, “power of concentration”

At the collective level, eight competencies are described such as : “taking responsibilities and decisions”, “working in a team”, “planning, coordinating and organizing”, “leadership”.

# Competencies and earnings

- Average income by country
- Basic earning models, with competencies
- Models for specific occupational groups (symbols manipulators, civil servants)

# Average income by country (euros, 1999)

<b>Country</b>	<b>Average</b>	<b>Std. dev.</b>
Germany	38111	13018
Norway	35207	9721
Austria	33367	13224
Finland	30473	12687
U.Kingdom	30369	16014
Japan	30100	11060
Sweden	29943	15086
Netherlands	28351	26149
France	24530	9948
Italy	21223	18488
Spain	16131	7706
Cz. Rep.	6029	7348
Total	28194	16552

NB : la population est limitée aux salariés à temps plein ayant passé au plus soixante mois sur le marché du travail et ayant un diplôme dont la durée théorique est comprise entre 3 et 6 ans.

# Basic model

Mincerian approach, with logarithm of earnings fitted by:

number of H.E. years (officially required to get the degree)

experience (from the graduation)

gender

age

country

field of study

weekly work hours

## In addition

The grades given by the graduates to the competencies required when they get their degree

	B	Std. dev.	Sign.
<b>Years of H.E.</b>	4.29 <sup>E</sup> -02	.005	.000
<b>Experience</b>	3.6E-03	.000	.000
<b>Gender(F=1;M=0)</b>	-.13	.008	.000
<b>Age</b>	7.4E-03	.001	.000
<b>Italy (ref.)</b>			
<b>Spain</b>	-.18	.018	.000
<b>Netherlands</b>	.33	.017	.000
<b>France</b>	.33	.016	.000
<b>Austria</b>	.45	.016	.000
<b>Finland</b>	.45	.021	.000
<b>Germany</b>	.63	.015	.000
<b>Norway</b>	.66	.015	.000
<b>Humanities (ref.)</b>			
<b>Social sciences</b>	5.17E-02	.015	.001
<b>Law</b>	5.71E-02	.017	.001
<b>Sciences/health</b>	.10	.012	.000
<b>Engineering</b>	.167	.013	.000
<b>Business</b>	.17	.014	.000
<b>Week work hours</b>	8.39E-03	.000	.000
<b>(cst)</b>	2.98	.078	.000

a Dependant variable : Logarithm of gross annual earnings (Kilos Euros)

The results of the basic model (2)

	B	Std.dev.	Sign.
<b>Computation skills</b>	1.98E-02	.004	.000
<b>Learning competencies</b>	1.31 <sup>E</sup> -02	.005	.017
<b>Foreign language proficiency</b>	1.16E-02	.004	.002
<b>Economic reasoning</b>	1.12E-02	.004	.003
<b>Analytical competencies</b>	1.08 <sup>E</sup> -02	.005	.021

a Dependant variable : Logarithm of gross yearly earnings (Kilos Euros)

# Earning models by occupational groups with competences

	Beta	Signification
<b>Symbol manipulators</b>		
Foreign language proficiency	.043	.002
Computation skills	.028	.039
Analytical competencies	.035	.008
Learning abilities	.033	.013
Other variables of the basic model		
N	3871	
Adjusted R2	.443	.000
<b>Civil servants</b>		
Ability to apply rules and regulations	.076	.000
Other variables of the basic model		
N	1634	
Adjusted R2	.370	.000



# Acquired and under-produced competencies

- The most acquired competencies
- The most under-produced competencies:  
difference between the proportion of graduates who declare a given competency to be required to a high or a very high extent, and the proportion who also state the same competency acquired to a high or a very high extent.

The mean of this difference is 20% with a standard deviation of 10%. We will thus consider the competencies with a difference between the two proportions that is higher than 30%.

# Competencies at Time of Graduation in 1994/95 (percent “high”; responses 1 and 2)

	<b>Euro pean Union</b>	<b>Japan</b>	<b>Mean</b>
<b>Learning abilities</b>	<b>83</b>	<b>55</b>	<b>80</b>
<b>Power of concentration</b>	<b>72</b>	<b>62</b>	<b>71</b>
<b>Loyalty, integrity</b>	<b>68</b>	<b>70</b>	<b>68</b>
<b>Working independently</b>	<b>72</b>	<b>31</b>	<b>68</b>
<b>Field-specific theoretical knowledge</b>	<b>67</b>	<b>53</b>	<b>66</b>

# Proportion of graduates declaring they are competent in under-produced competencies

	<b>Europe an Union</b>	<b>Japan</b>	<b>Mean</b>
<b>Problem-solving ability</b>	<b>58</b>	<b>39</b>	<b>56</b>
<b>Working under pressure</b>	<b>55</b>	<b>36</b>	<b>53</b>
<b>Taking responsibilities, decision</b>	<b>48</b>	<b>29</b>	<b>47</b>
<b>Time management</b>	<b>45</b>	<b>33</b>	<b>44</b>
<b>Planning, co-ordinating and organising</b>	<b>39</b>	<b>18</b>	<b>37</b>
<b>Computer skills</b>	<b>31</b>	<b>29</b>	<b>31</b>

**Proportion of highly competent graduates (answ. 1 and 2) for under-produced competencies (individual and collective tasks)**

**Under-produced competencies (individual tasks)**

	<b>Problem-solving ability</b>	<b>Working under pressure</b>	<b>Time management</b>	<b>Computer skills</b>
<b>Sweden</b>	<b>75</b>	<b>68</b>	<b>32</b>	<b>29</b>
<b>U.K.</b>	<b>65</b>	<b>67</b>	<b>55</b>	<b>41</b>
<b>Netherlands</b>	<b>64</b>	<b>56</b>	<b>49</b>	<b>39</b>
<b>Norway</b>	<b>64</b>	<b>62</b>	<b>44</b>	<b>33</b>
<b>Germany</b>	<b>59</b>	<b>56</b>	<b>38</b>	<b>32</b>
<b>Finland</b>	<b>59</b>	<b>54</b>	<b>43</b>	<b>37</b>
<b>Austria</b>	<b>58</b>	<b>59</b>	<b>44</b>	<b>36</b>
<b>France</b>	<b>52</b>	<b>48</b>	<b>45</b>	<b>24</b>
<b>Spain</b>	<b>51</b>	<b>37</b>	<b>54</b>	<b>21</b>
<b>Italy</b>	<b>47</b>	<b>51</b>	<b>50</b>	<b>20</b>
<b>Czech Rep.</b>	<b>41</b>	<b>46</b>	<b>36</b>	<b>30</b>
<b>E.U.</b>	<b>58</b>	<b>55</b>	<b>45</b>	<b>31</b>

**Under-produced  
(collective tasks) competencies**

**Taking  
responsibilities,  
decision**                      **Planning, co-  
ordinating and  
organising**

<b>Sweden</b>	<b>62</b>	<b>54</b>
<b>U.K.</b>	<b>61</b>	<b>37</b>
<b>Netherlands</b>	<b>53</b>	<b>33</b>
<b>Norway</b>	<b>51</b>	<b>31</b>
<b>Germany</b>	<b>51</b>	<b>46</b>
<b>Finland</b>	<b>49</b>	<b>51</b>
<b>Austria</b>	<b>47</b>	<b>38</b>
<b>France</b>	<b>46</b>	<b>41</b>
<b>Spain</b>	<b>39</b>	<b>39</b>
<b>Italy</b>	<b>39</b>	<b>18</b>
<b>Czech Rep.</b>	<b>38</b>	<b>35</b>
<b>E.U.</b>	<b>48</b>	<b>39</b>
<b>Japan</b>	<b>29</b>	<b>18</b>

# **The relation between modes of teaching and learning, provision of study and competencies acquired**

- the correlations between the variables of the two dimensions (modes of teaching and competencies) have been systematically computed amongst the 35000 interviewed graduates.

**Modes of teaching and learning, types of provision of study which have a major impact on the under-produced competencies, and related countries**

Modes of teaching and learning, types of provision of study	Influence upon under-produced competencies		Countries providing more
	Individual level (1)	Collective level (2)	
Attitudes and socio-communicative skills		X	Netherlands, United Kingdom ,Norway
Project and problem-based learning	X	X	United Kingdom ,Norway
Independent learning	X	X	Italy, Netherlands, United Kingdom, Finland, Norway
Direct acquisition of work experience		X	Sweden, Netherlands, Norway
Practical emphasis of teaching and learning	X	X	Netherlands, United Kingdom
Teaching quality	X	X	United Kingdom
Course content of major	X		United Kingdom

(1) "problem-solving ability", "working under pressure", "time management"

(2) "collaborative problem-solving", "communication", "teamwork", "social skills"

Previous changes in universities have essentially been quantitative ones to face increasing demand for higher education

Contemporary challenges are different: because of the stabilisation or even the decrease in the size of the young cohorts, more attention can be given to qualitative rather than to only quantitative adaptation. Indeed, contemporary economies require competencies that suppose new modes of teaching and learning.



More difficult for universities to promote qualitative evolutions than quantitative ones.

- Qualitative evolutions mean changes in the way of teaching and learning, i.e. in the way in which many academics work.
- Are faculty ready to change?
- Since academic work relies on autonomy and self control, which incentives could be implemented in a world where the professional careers depend more on research results than on student performances?

Some concluding solutions:

(1) To make explicit the tacit curriculum, through:

- explicit presentation of competencies required to obtain the different degrees, first degree, master's degree or doctorate
- presentation of the contents of the different subjects in terms of competencies produced.

*Such practice is not so original for vocational training, but it seems rather new for traditional universities.*

- (2) Development of university teaching and learning centres in order to develop new teaching and learning methods, to train professors, to promote the use of teaching assessments.
- (3) Continuous assessment of teaching should enable courses contents and teaching methods to be properly questioned
- (4) The success of effective university teaching requires also changes in the system of teachers' earnings and compensation

- Universities are institutions which change with difficulty. Nevertheless, they need to change themselves to new requirements, otherwise they will know the destiny of dinosaurs.

