Gerhard Bosch

Innovation and lifelong learning

Knowledge Management and Lifelong Learning

European Network 'Enterprise for Health'

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Innovation and lifelong learning

Structure of the Presentation

1 Changes in product and labour markets
2 Myths in the discussion on education and work
3 Co-financing life long learning
4 Examples of LLL from Europe
1. Changes in product and labour markets

1.1 1st Trend: Investments in intangibles are becoming more important than investments in tangibles

- Old technologies require more investments in tangibles (railroadification).
- The new more knowledge-based technologies require more investment in intangibles.
- The relation between the stock of investments in tangibles and intangibles changed from 2 to 1 in the 20's to 1 to 1.2 in the 90's.

### US Capital Stocks

**Billions of Dollars**

<table>
<thead>
<tr>
<th>Year</th>
<th>Tangible (structures and equipment, inventories, material resources)</th>
<th>Non-tangible (education and training, health and safety mobility, R&amp;D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>6075</td>
<td>3251</td>
</tr>
<tr>
<td>1948</td>
<td>8120</td>
<td>5940</td>
</tr>
<tr>
<td>1973</td>
<td>17490</td>
<td>17349</td>
</tr>
<tr>
<td>1990</td>
<td>28525</td>
<td>32819</td>
</tr>
</tbody>
</table>

Source: Abramovitz, M., David, P. 1996: Employment and Growth in the Knowledge-based Economy. OECD
1. Changes in product and labour markets

1.2 2nd Trend: Education is getting more and more the entry ticket into the labour market

- The higher the skill level the higher the employment rate.
- Low education means more and more exclusion from the labour market.

<table>
<thead>
<tr>
<th>Educational Potential</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>61.8</td>
<td>37.7</td>
</tr>
<tr>
<td>Intermediate</td>
<td>77.0</td>
<td>63.8</td>
</tr>
<tr>
<td>High</td>
<td>86.5</td>
<td>78.9</td>
</tr>
</tbody>
</table>

Employment Rates for Men and Women (aged 15-64) by Educational Potential in the EU 15, 2002

1. Changes in product and labour markets

1.3 3rd Trend: Working hours differ increasingly by educational attainment

- The higher the skill level the longer the working hours
- “Brain operating hours” are becoming more important than machine operating hours
- Skill shortages have been reduced by increase in working hours
- Low skilled work is less and less utilised
Actual weekly working hours in West Germany

Source: Socio-Economic Panel
1. Changes in product and labour markets

1.4 Positive Returns to Human Capital Investments

- Individual returns: increase of wages
  (6.5% per additional year of schooling in EU)
- Macroeconomic returns:
  (a) increase of aggregate productivity
      (5% on impact/ a further 5% in the long run in EU)
  (b) faster technological change
- Social cohesion: reduction of inequality and social distance improves economic performance

Caution: Most data refer to quantity of formal schooling. Quality indicators of learning and informal learning also shows positive effects

Source: EU 2003, Human capital in a global and knowledge based economy, Luxembourg
1. Changes in product and labour markets

1.5 The Human-Capital-Paradox

Higher individual returns in countries with deregulated labour markets (returns on additional year of schooling in Scandinavia 4% and in UK 12%)

Neoclassical explanation: more effective pay scales which reflect productivity differences more closely in deregulated markets

Alternative explanations: underinvestment in training in deregulated economies, more polarised skill structures and skill shortages

Human-capital-paradox: in spite of high monetary incentives for investments due to high income inequality low investment of low skilled

Explanation of the paradox:

- high investment risk because of high dispersion of returns
- long working hours of low skilled
- low incomes and saving rates
- tayloristic work organization
- lack of formal pathways for low skilled
- high social distance
Educational levels in West Germany and the USA, 1989

- **High school**: USA - 45%, Germany - 16%
- **College, Associate Degree**: USA - 30%, Germany - 69%
- **Bachelor's degree**: USA - 17%, Germany - 7%
- **Master or higher**: USA - 8%, Germany - 8%

1. Changes in product and labour markets

1.6 Ageing of work force but low employability of older workers

Employment rate by educational potential (age 55-64), Germany

1.7 Location of Innovation Capabilities in German Production Enterprises

- Capabilities for reorganisation (n=1399):
  - Structures and Instruments: 7%
  - Groups of employees: 14%
  - Single or few employees: 69%
  - Not relevant for enterprise: 10%

- Capabilities for process innovation (n=1398):
  - Structures and Instruments: 6%
  - Groups of employees: 14%
  - Single or few employees: 73%
  - Not relevant for enterprise: 7%

- Capabilities for product innovation (n=1389):
  - Structures and Instruments: 5%
  - Groups of employees: 12%
  - Single or few employees: 73%
  - Not relevant for enterprise: 10%

### 1. Changes in production and labour markets

#### 1.8 Employment Growth and Innovation in % (2000 to 2002)

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>No innovation</td>
<td>0.9</td>
</tr>
<tr>
<td>(n = 83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td>Innovation on R&amp;D</td>
<td>8.4</td>
</tr>
<tr>
<td>(n = 75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td>Innovation on Product-Service-combination</td>
<td>17.9</td>
</tr>
<tr>
<td>(n = 74)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 4</td>
<td>Innovation on Process modernisation</td>
<td>18.1</td>
</tr>
<tr>
<td>(n = 40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 5</td>
<td>Innovation on all levels</td>
<td>17.9</td>
</tr>
<tr>
<td>(n = 21)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Fraunhofer ISI, 2004, PI–Mitteilung 33, p. 9
2. Myths in the discussion on education and work

2.1 1st Myth: The half-life of skills and knowledge is declining

- Most of the general skills (languages, mathematics) last a whole life, if they are used. This is also true for the social skills.
- Basic vocational training have a long half-life.
- Specific vocational skills have a decreasing half-life.

Conclusion:

- General skills have to be learned early.
- Broad vocational skills in initial vocational training.
- More further training to fresh up and extend specific vocational training.
2. Myths in the discussion on education and work

2.2 2nd Myth: One should be prepared to change occupation several times in a work life

- Might be true if occupations are very specific and are mainly based on-the-job training.
- Broad occupations make it possible to cope with structural change (further training is required).
- Multiple occupation changes waste resources.

**Conclusion:** Develop broad occupations.
2. Myths in the discussion on education and work

2.3 3rd Myth: Technological development is progressing so rapidly that training based on fixed curricula and certificates are no longer viable

- Some early adopters and computer kids may learn only by doing or on-the-job
- If there are no general standards for curricula and certificates there will be de-facto standards of Microsoft, SAP, Cisco etc. Skills are not transferable

**Conclusion:**

Because of fast changes learning has to be changed:
- Traditional classroom teaching has to be combined with learning in real projects
- Curricula have to be opened for changes
2. Myths in the discussion on education and work

2.4 4th Myth: Training must be increasingly oriented along the needs of the companies

- Many companies, especially SME’s, are planning on a short-term basis and do not know their needs in the future.
- Asking them about their need is like “A blind person asking another blind person about the way”
- Not all companies are innovators: their needs may be formed by old technologies and traditional forms of work organisation.
- Many future companies are not yet in existence.

**Conclusion:** We need a pro-active supply side-approach of identifying future needs and translating these needs into curricula.
3. Co-Financing LLL

- Need for more investment in LLL
- General returns are higher than individual returns (externalities)
- Underinvestment in training for four reasons
  - If each actor only invests corresponding to his/her individual returns – underinvestment in training
  - Investments costs are calculable – returns often not
  - Returns often difficult to measure (like social cohesion)
  - Competencies often not visible (no certification)
- Conclusion of OECD: Co-Financing
In most countries SME’s invest less in training than big companies.

**REASONS:**

- Money is one but not the major obstacle
- Less need for training (high percentage of technology appliers)
- Higher risks of investments due to higher manpower turnover
- Low internal planning capacity
- No economies of scale in training
- Lack of transparency of training market
- Supply not tailor-made for SME’s
- High specialisation/ internal learning too narrow
4.2 Small firm development account in UK

- Pilot Program in Leicestershire & Lincolnshire carried out by the “Centre for Entreprises” launched in 2002
- A mechanism to stimulate business led workforce development in small companies (5 – 50 employees)
- Training advisor of the Centre and ”Training Champion” appointed by the firm develop ”Training and Development Plan”
- Company receives £ 500 after signing the plan / Centre pays up £ 150 per employee for external training

RESULTS:
- 280 Training Champions attended workshops
- 230 approved training plans
- Average 20 employees per business
- Average 11 employees per plan
4. Examples of LLL from Europe

4.3 Pathways for individuals and companies

Major problem: Lack of transparency of training market

makes the fit between training and work organisation for companies difficult (high transaction costs)

Possible solutions:

- Generally or broadly recognised certificates
- Certification and quality assurance of providers

Conclusion: Both solutions have to be linked
Training Pathways in the German IT-Industry

**Strategic Professionals**
- Certified IT Technical Engineer
- Certified IT Business Engineer

**Operational Professionals**
- Certified IT Systems Manager
- Certified IT Business Manager
- Certified IT Business Consultant
- Certified IT Marketing Manager

**Specialists**
29 Specialist profiles for 6 IT sectors:
- Software Developer
- Solutions Developer
- Administrator
- Co-ordinator
- Technician
- Advisor

**Vocational Training**
- IT System Electrician
- IT System integration Specialist
- IT System Support Officer
- IT System Officer


Key elements:

- The social partners agree that lifelong learning is the key for future competitiveness of the companies and the employability of the employees.
- Each employee has the right to a regular talk with the employer on his/her individual training needs.
- Employees on parental leave also have the right to such a talk.
- If there are training needs, an individual training plan will be agreed upon.
- In the case where there is no agreement the employers and the works council or in companies with more than 300 employees a commission (parity of seats) should try to reach an agreement.
- If they do not reach an agreement a representative of the new "Agency to promote further training" will become a member of the commission with the right to vote.
- The employer pays the training.
4.5 Grants and loans for adults in Sweden

- Since 2001 an integration of grant and loan systems for young and adult students
- Grants and loans for school and vocational certificates and for university study
- Grants and loans for adults 6776 SEK
- For learners up to 25 years 34.5% grant / for older learners 82% grant
- Grants and loans up to 50 years
- Entitlements for unpaid training leaves up to 5 years
- Education and training supply for adults very flexible
4.6 Levy-system in France

- Levy of 1.6% of gross wage (companies with less than 10 employees 0.55%)
- 1.0% for company training/ levy-exemption-system / if company invests less in training money goes to industry-funds administered by social partners
- Levy for agency workers 2%
- 0.6% go to special funds for individual training plans or integration of young people
- Individual right for each employee for 20 hours training per year/accumulation up to 100 hours
- Over 40 years right for “bilan de compétences”
- Entitlement for un-paid training leave up to 1 year

4. Examples of LLL from Europe
4. Examples of LLL from Europe

4.7 Saving plan at Scandia

- Individual saving accounts at company level since 1999
- Individual saving minimum 1% and maximum 5% of yearly gross income (use 2003 40%)
- Company adds the same amount to the account and three times of individual saving to accounts for employees older than 45 with a tenure of more than 15 years
- Free disposal of employee on account, but 85% job-related (company training is paid by the company)
- Linked with E-Consultation and personal development
- Results: More job rotation - delegation of responsibility – higher attractiveness on labor market
4.8 Sharing of training time between employees and the company at Volkswagen since 2001

- Investment in Wolfsburg to produce Touran
- Own collective agreement with 35 working hours and 3 training hours per week (1.5 hour paid, 1.5 unpaid)
- Only unemployed were recruited
- Hierarchical levels were reduced from 9 to 4
- Decentralization of decisions to teams
- Process oriented training
- Training centre in the middle of the plant
- Scheme under evaluation