

The Challenges of Teaching and Research in Finnish Polytechnics

Jussi Välimaa, University of Jyväskylä
Marja-Liisa Neuvonen-Rauhala, Lahti
University of Applied Sciences

Finnish Higher Education

20 universities & 31 polytechnics located all over the country

- Mass higher education system: 307 000 students; 177 000 students in universities and 130 000 in polytechnics.
- Steered & funded by the Ministry of Education
- Nordic welfare state
- Non-university sector established in the 1990s (1992-2000)

Finnish polytechnics by student numbers in 2005

- Small polytechnics:
 - < 3000 students 10 inst.
- Medium-sized polytechnics:
 - 3000-5500 students 11 inst.
- Large polytechnics:
 - 5500-10 000 students 9 inst.

NATIONAL POLICIES

- **the Polytechnic Act (351/2003, 4§):** the tasks of polytechnics are "to provide *teaching* which is based on scientific or artistic foundations aiming to produce high expertise in the related fields, to support students *professional development*, to conduct *applied research and development* which supports both the *development of teaching and regional development* and working life with the aim of *advancing regional economic structures*." (Free translation, J.V.)

The Role of the Development Plan for Education & Research

- **Development Plan** translates national legislation into policy goals
- Steering based on **performance agreements**: translates policy goals into actions
- **Strategic goals and guidelines for research:** Polytechnics have become essential actors in the regional innovation system (MinEdu)
- Aim is to develop the division of work between universities and polytechnics & to deepen their cooperation amongst themselves and with other actors in the research system.

Staff in Finnish Polytechnics by Gender & Degree in 2004 (in %). AMKOTA database.

Senior lecturer	<i>Proportion of female:</i> 40,2%	<i>Ph.D & Lic:</i> 63,7%	<i>M.A:</i> 26,8%	<i>B.A & Pol.degr:</i> 1,4%
Lecturer	62%	6,9%	71,1%	16,3%
FT teacher	53,4%	25,1%	34,0%	9,4%
Total	56,3%	34,7%	47,2%	9,2%

Funding of research

- Research and development in polytechnics is about 10 per cent of the R&D conducted in universities in 2004.
- Funding based on other than governmental resources is only 15 % from that in universities
- the European Social Fund is the most important funding body for R&D in polytechnics.

	2000	2001	2002	2003	2004	2005	2006
R & D m€	32	44	56	49,6	88,7	99,6	-
Staff	411	455	422	421	446	455	492
Staff / R&D	-	-	296	482	484	579	614
Staff / bus. act.	341	327	288	278	274	270	276

Collaboration with universities and industry

- locality is the most important factor for companies
- the activity of polytechnic teachers is crucial when the collaboration starts.
- Usual ways: theses & contract research & development projects
- The intensity of collaboration also depends on general economic situation (Marttila et al. 2004, 103-104).

Allocation of working hours for teaching & research

Staff	N	Teach %	Res. %	Other %	h/week
Total	4635	74	10	16	41
Sen. Lect.	747	64	16	20	42
Lect.	2740	75	8	20	42
FT t.	1098	81	7	12	40
Res.	49	30	47	24	35

The organisation and management of research

- Several organisational solutions
- Most polytechnics emphasize that R&D is connected to teaching development
- All polytechnics have persons responsible for coordinating research projects
- Some polytechnics have established a R&D unit to support R&D activities & projects
- In 2004, manpower allocation varied between 1-100 FTe working years for R&D in polytechnics

The relevance of research for the regional community?

- **1) The Case of Jyväskylä University of Applied Sciences:**
- 8000 students
- 780 staff members
- turnover €50 (2006)
- 32 bachelor-level & 2 masters-level study programs
- 100 FTe working years for R&D projects

R&D Projects (51 on-going):

- Agricultural training and development projects (e.g. agricultural tourism in Central Finland)
- Business skills development projects (e.g. business skills for creative enterprises)
- Education (e.g. Teachers' Evaluation and Assessment Skills-project)
- Energy development projects (e.g. BioHousing-project -> sustainable & competitive biomass heating of private houses)
- Internationalisation (e.g. path to internationalisation-project)
- IT development and training projects (e.g. LASSO-project to enhance the use of wireless technologies)
- Regional business development projects
- Social infrastructure development projects
- Tourism (e.g. "Net maker project" to increase cooperation between SMEs in Central Finland)
- Wellness technologies (e.g. Wellness Dream Lab-project to develop & promote business activities)

Crucial elements in JUAS

- A systematic way to strengthen the weak signals:
- 1) A cup of coffee. Informal social structures favouring brainstorming of new ideas in the study fields
- 2) every study field has a project manager responsible for developing new ideas into new projects
- 3) institutional support to develop ideas into projects. The staff responsible for developing ideas into projects choose the best projects and help to find funding for them
- 4) The strategy of JUAS guides R& D activities

2) The Case of Lahti University of Applied Sciences

- 5000 students & 450 staff members.
- The majority of the R&D projects are led and run by project staff working in the Innovation Centre.
- Innovation Centre is a specific unit in the LUAS, (est. 2004) with the aim to lead, coordinate and develop Research and Development in LUAS.
- The organisational role of the Innovation Centre has been evaluated as central for LUAS (Karppanen et al. 2007.)
- Appr. 30 ongoing projects in LUAS in autumn 2007 partly funded by The European Social Fund (ESF) & funding from companies & LUAS.

R&D projects in LUAS

- 1) to develop know-how and skills of staff in companies
- 2) to develop education
- 3) developing business, competitiveness, and internationalisation and establishment into new market areas
- 4) entrepreneurship and business succession
- 5) tourism development
- 6) anticipating future needs for labour force and education
- 7) promoting R&D activities and education in disciplinary fields.

Two types of strategies for promoting R&D in polytechnics

- **The Strategy of Centralization** describes organizational solution to concentrate all R&D activities into one separate R&D unit. The aim is to make R&D as efficient as possible through central steering of development projects.
- **The strategy of integration** describes an organizational model in which the objective is to create institutional support structures to promote the execution of R&D Projects in the polytechnic, and to integrate teaching development with R&D.

The Strategy of Centralization:

- **Strengths:**

- 1) Institutional support
- 2) Efficient use of resources
- 3) The emergence of a specialized staff to take care of the development projects.

- **Development challenges:**

- 1) the emergence of group of research specialists may lead to a group of people who are more interested in finding new funding than thinking about the needs of the region
- 2) how to strengthen weak signals from the region? How are the development of teaching connected with the development projects?

The Strategy of Integration

- **The strengths:**
 - 1) Sensitivity to local needs.
 - 2) Systematic development of ideas into projects
 - 3) The Integration of teachers with the R&D projects
- **The challenge:**
 - 1) How to secure the accumulation of project management expertise when there is not a group of staff specialised in R&D projects?

The Challenges of Teaching

- **Three pedagogical traditions:**
- 1) Apprenticeship model (tacit knowledge, learning by doing)
- 2) vocational training (strong teacher profession)
- 3) higher education (influence of disciplinary traditions)
- How to combine theory with practise?

R&D or T&D?

- the nature of the projects resembles more Training and Development (T&D) than Research and Development (R&D)
- Is R&D a relevant concept to describe this activity?
- Is R&D a relevant objective for polytechnics which aim to development processes and practices in their regions, but should they instead aim to create T&D processes?