Internationalisation: from quantity to quality by evolving collaborations across academic teaching and research

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Abstract

The country of Switzerland is ranked among the worldwide top Innovation ecosystems. With the inception of the new Institute of Innovation & Technology Management at LUASA, the internationalisation strategy is moving towards select partnerships across academic areas including joint innovative teaching formats, joint research programs, faculty exchange and joint degrees.
Swiss Innovation Ecosystem

**Figure 8: European Countries’ Innovation Performance**

Note: Average performance is measured using a composite indicator building on data for 24 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. Average performance in 2010 reflects performance in 2008/2009 due to a lag in data availability.

Innovation Union Scoreboard (2011)
Swiss Innovation Ecosystem

Swiss Made, J. Breiding, 2012
Unique Swiss Dual Education System

Höhere Berufsbildung

Eidg. Diplom
Eidg. Fachausweis

Berufs- und höhere Fachprüfungen

Diplom HF

höhere Fachschulen

Master
Bachelor

Fachhochschulen

Hochschulen

Master
Bachelor

PhD/Doktorat
Master
Bachelor

Pädagogische Hochschulen

Universitäten ETH/EPFL

Berufsorientierte Weiterbildung

Vocational Training

Betriebe, Berufsfachschulen, überbetriebliche Kurse

Berufsmaturität

Eidg. Fähigkeitszeugnis

Fachmaturität

FMS Ausweis

Gymnasiak Maturität

Allgemein bildende Schulen

Berufliche Grundbildung

Betriebe, Berufsfachschulen, überbetriebliche Kurse

Fachmittelschulen

Gymnasien

Obligatorische Schule

Brückenangebote
7 Universities of Applied Sciences in Switzerland and the Federal Institutes of Technology
Lucerne University of Applied Science at the Heart of Switzerland
Lucerne – Study in the heart of Switzerland
Lucerne University of Applied Sciences and Arts

- Engineering & Architecture
- Business
- Information Technology
- Social Work
- Art & Design
- Music
School of Engineering & Architecture

9 Institutes

10 Bachelor programs (BSc degree) – 1 program in English

2 Master programs in Engineering and in Architecture (MSc degree)

2’053 Students

>200 R&D projects per year

>35 Continuous education programs
School of Engineering & Architecture

- 141 Full-time lecturer
- 58 Part-time lecturer
- 249 Assistant lecturer / Junior and senior researchers
- 59 Technical and administrative staff
School of Engineering & Architecture

9 Institutes:
- Architecture
- Interior Architecture
- Civil Engineering
- Building Technology & Energy
- Electrical Engineering
- Mechanical Engineering & Energy Technology
- Innovation & Technology Management
- Medical Engineering
- Natural Sciences & Humanities
Institute for Innovation & Technology Management

- Education
  - Graduate
  - Undergrad

- Graduates
  - Industrial Partners
  - Economy
  - Society

- Continued Education

- Applied R&D
Interdisciplinary Approach
Innovation along the Lifecycle

Product Life Cycle

Phase Out (Ausstieg)

Usage (Nutzung)

Deliver (Anwendung/Vermarktung)

Develop (Umsetzung/Entwicklung)

Define (Bewertung/Auswahl)

Discover (Ideengenerierung)

CUSTOMER CENTERED
Using state of the art infrastructure & methods...

... for a practical and future oriented Education
Bachelor and Master Programs are very closely linked to Industry
Innovative Projects

Remote Diagnostics and Fleet Management for Construction Machines

Student: Andreas Neuhaus
Lecturer: Thierry Aubert
Industrial partner: SUNCAR HK AG

Developing a Marketing Strategy for a Radical Innovation

Student: Lena Herting
Lecturer: Peter Radcliffe-Lunn
Industrial partner: Medela AG
Innovative Projects

**Proof of Concept: New concept for distribution of goods in buildings**

Student: Maximilian Zimmermann  
Lecturer: Günter Zepf  
Industrial partner: Schindler Elevator

**Reduction of changeover times in operating theatre: Potential and opportunities for a service provider in Lean Healthcare**

Student: Fabio Röllin  
Lecturer: Dr. Silvio Di Nardo  
Industrial partner: Leancom GmbH
Wide range of modules taught in English at BSc level

- **Science & Technical:** Mathematics and Physics, Mechanical Engineering, Electrical Engineering and Computer Science
- **Business:** Marketing and Accounting, Controlling, International Marketing
- **Product Management, Strategic Management, Service Innovation, Operations Management, etc.**
- **Design/Innovation:** Industrial Design, Open Innovation, etc.
- **Interdisciplinary projects** with external partners (Engineering Development Projects, International Project)
- **Intensive weeks** in February (Intellectual Property Management, Recycling) and in September (Lucerne International Summer School, Leadership, Distribution Management, Recycling)
Internationalisation is a key strategy

- 90% of BSc Industrial Engineering | Innovation students choosing semester abroad
Student exchange destinations (2009)
Student exchange destinations (2011)
Student exchange destinations (2013)
Current Partnerships (2016)
Incoming Students get to see the country in Fall
... and in spring high up above Lake Lucerne
... what’s next? From quantity to multilayered partnerships

• **Internationalise MSc**

• **R&D partnering / joint projects (H2020)**

• **Lecturer Exchange**
MSs Program as a vehicles for research/education based student exchange

- English taught
- 3 major research projects
- Company Internships
H2020 Research: Business Models for intelligent renewable energy integration

**Input**
- Requirements from the electric grids
- Electrolyser technology boundaries and requirements
- Existing standards

**Output**
- Development of Standardized test protocols for electrolyser grid services
- Protocol and hardware validation in different electrolyser environments
- Identification of new and update of existing KPIs for electrolysers
- Identification and techno-economical analysis of business cases

- Standardised test protocols for most promising grid services
- Most promising grid services for electrolyser use
- Updated KPIs for electrolysers (> 3MW) in grid services

www.Qualygrids.eu
Company description
It has developed a web-based platform that enables the user to model all cash flow related to investments in renewables.

Purpose
Develop **financial support models for renewable energy** such as: solar power, onshore wind, offshore wind and hydro power.

Project Example: 4 months, 360h
Project example: 5 months, 540h

Company description
ABB Turbocharging is a technology and market leader in the manufacture and maintenance of turbochargers.

Purpose
Can IoT can be used by product-based manufacturing companies to improve their customer value proposition as well as internal and external processes?
Example Master Thesis: 6 months, 810h

**Company description**
SKAN is one of the pioneer companies in the field of cleanroom equipment and isolator design for the pharmaceutical industry.

**Purpose**
To create a value based pricing model and study the feasibility of implementing such model in the manufacturing organization.
New Partnerships are possible, consisting of one or more new layers

- Staff Mobility
- Exchange BSc
- Exchanges MSc
- aR&D (Horizon 2020, etc)
Conclusions

• leading student exchange position among Swiss Applied Science Universities with more than 90% of students choosing exchange at 40 partner UNIs

• With the new organisation IIT we are moving to multilayered partnership which can include MSc student exchange within applied research projects

• Staff mobility is possible on a short term basis through a short term sabbatical (2 weeks).
Thank you!
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