Feasibility Study for a Curriculum Comparison in Vocational Education and Training

CIEB Advisory Board Meeting, August 4-6, 2015

Dr. Ursula Renold, ETHZ – KOF Swiss Economic Institute, Zurich
Overview

The three phases of the Feasibility Study

Phase I:
- Analytical framework: Comparing VET Systems
- 2x10 top performer with regard to VET
- Correlation between top performers

Phase II:
- Research Design
Overview of the Project Phases of the Feasibility Study

MAIN STUDY

Research Question: What are the main features of VET curricula of top-performing countries?

Research Design: Comparative Curriculum Analysis

Data Sampling and Collection

Data Analysis

Data Interpretation

FEASIBILITY STUDY

Can the main research question be answered and if yes: how?

Project Phases

1) Definition and selection of top-performing countries

2) Classification of comparable VET systems and occupations

3) Theoretical and methodological instrument to carry out comparison
Analytical Framework: Comparing VET Systems

Governance

Educational Process

Theoretical framework
System Theory

Curriculum Theory barely deals with the specific needs of VET, notably addressing the **interfaces between the education and employment systems**.

Importantly, VET curricula have to consider the **informational couplings** between these two systems. Thus, little generalizable theoretical knowledge exists on how this interface should be treated.

Therefore, a perspective should shed light on these **specific interfaces**. *Systems Theory* (Luhmann, 1994; Eichmann 1989) provides an approach for the investigation of **coordination and control problems between the education and employment systems**.
System Theory

<table>
<thead>
<tr>
<th></th>
<th>Encoding («Kodierung»)</th>
<th>Programming («Programmierung»)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection of unit</td>
<td>Career («Karriere»)</td>
<td>Education («Bildung»)</td>
</tr>
<tr>
<td>Structuring of operations</td>
<td>Pass / Fail («positiv / negativ»)</td>
<td>Curriculum («Lehr- und Lernpläne»)</td>
</tr>
</tbody>
</table>

*Table 1*: Encoding and programming of the education system; table has been adapted from Niklas Luhmann (1994 p. 196); terms parenthesized in German stem from the original

<table>
<thead>
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<tbody>
<tr>
<td>Reflection of unit</td>
<td>Price (wage)</td>
<td>Market (labor market)</td>
</tr>
<tr>
<td>Structuring of operations</td>
<td>Payment / Non-payment</td>
<td>Supply and demand</td>
</tr>
</tbody>
</table>

*Table 2*: Encoding and programming of the economic (and employment) system; own depiction
Education System

«College for all»-Strategy
(United States)

Versus

«Employment first, University later»
(South Korea)

Our Education System

“Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid.”

– Albert Einstein
System Theory: Characteristics of VET Systems

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Reflection of unit</strong></td>
<td>Professional Career</td>
<td>Education</td>
</tr>
<tr>
<td><strong>Structuring of operations</strong></td>
<td>Pass / Fail</td>
<td>VET Curriculum</td>
</tr>
</tbody>
</table>

*Table 3: VET system code and programming (own depiction)*

<table>
<thead>
<tr>
<th></th>
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<th>Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reflection of unit</strong></td>
<td>Wage</td>
<td>Labor Market</td>
</tr>
<tr>
<td><strong>Structuring of operations</strong></td>
<td>Payment / Non-payment</td>
<td>Skills supply and demand for labor</td>
</tr>
</tbody>
</table>

*Table 4: Employment system code and programming (own depiction)*
Couplings Between Different Societal Systems

- **Selection for career**: This means selection for either a progression route within the education system or for a meaningful job in the labor market.

- Progression routes are shown in the *structure of an education system*.

- Lack of skilled work force is a sign for *coordination and control problems (disfunctions)* between education and employment systems.
Switzerland: Functional Differentiation Over Time

**Professional Education and Training (Tertiary-Level B)**
- 1978: Advanced Federal PET Diploma, Federal PET Diploma
- 1996: National PET examinations
- 2004: Functional Differentiation of Swiss Edu System
- CM 2006

**Higher Education (Tertiary-Level A)**
- 1996: Doctorate, Master's degree, Bachelor's degree
- 2004: Universities/Federal institutes of technology
- 2005: Baccalaureate

**Entry Age**
- Average: 32/35/25
- 2004: 20
- 1996: 19
- 1978: 16

**Functional Differentiation Over Time**
- 2004: Federal VET Diploma
- 2004: Baccalaureate schools
- 2005: General education schools

**Compulsory Education**
- Direct access
- Additional qualifications required

ETHZ/KOF • Dr. Ursula Renold
Functions of the education system are analyzed to find out the extent to which,

a. the individuals are enabled to independently shape their own biography, their relationship to their environment and life in the community (individual control ability)

b. the abilities required on the labor market are made available, thus securing the volume of labor, quantitatively and qualitatively, that is necessary for prosperity and social development (human capital)

c. social participation is ensured, including the aspect of social cohesion (equality of opportunity / equity)

Source: Klieme et al. 2006
Figure 3: The Curriculum Value Chain, with “design,” “application,” and “outcome” phases (own graph by Renold/Rageth, 2015)
## 10 Top Performer According to the KOF YLMI

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Index score</th>
<th>Number of available indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switzerland</td>
<td>5.67</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Netherlands</td>
<td>5.57</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Denmark</td>
<td>5.48</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Norway</td>
<td>5.37</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Germany</td>
<td>5.36</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>Austria</td>
<td>5.33</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Luxembourg</td>
<td>5.21</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>Lithuania</td>
<td>5.11</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>Slovenia</td>
<td>5.05</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>Iceland</td>
<td>5.03</td>
<td>11</td>
</tr>
</tbody>
</table>

### Table 5: 10 top-performing countries in 2012 according to the KOF YLMI. Note that only countries with at least 8 indicators are included in this ranking. Source: KOF; internal calculation based on revised values from the first release of the KOF YLMI.
### 10 Top Performer According to the PISA Scores

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>PISA score (average of three subjects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shanghai</td>
<td>587</td>
</tr>
<tr>
<td>2</td>
<td>Singapore</td>
<td>556</td>
</tr>
<tr>
<td>3</td>
<td>Hong Kong</td>
<td>554</td>
</tr>
<tr>
<td>4</td>
<td>Korea</td>
<td>542</td>
</tr>
<tr>
<td>5</td>
<td>Japan</td>
<td>540</td>
</tr>
<tr>
<td>6</td>
<td>Taiwan</td>
<td>535</td>
</tr>
<tr>
<td>7</td>
<td>Finland</td>
<td>529</td>
</tr>
<tr>
<td>8</td>
<td>Estonia</td>
<td>526</td>
</tr>
<tr>
<td>9</td>
<td>Canada</td>
<td>522</td>
</tr>
<tr>
<td>10</td>
<td>Poland</td>
<td>521</td>
</tr>
</tbody>
</table>

*Table 6: 10 top-performing countries in 2012 by PISA score. Note that Liechtenstein was excluded due to limited relevance.*
Switzerland

In Switzerland, Vocational and Professional Education and Training (VPET) is under the Ministry of Economy, Education, and Research. The State Secretariat for Education, Research and Innovation (SER) issues education ordinances for each VET program. VPET ordinances shall be issued at the request of professional organizations (Article 9 VPETA).

**Economic Data**

<table>
<thead>
<tr>
<th>Year</th>
<th>Score</th>
<th>Rank</th>
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<tbody>
<tr>
<td>2011</td>
<td></td>
<td></td>
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<tr>
<td>2012</td>
<td></td>
<td></td>
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</tbody>
</table>

**Key Indicators**

- Population: 7.91
- Education Budget (% of GDP): 5.47

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Singapore

In Singapore, the Ministry of Education facilitated the development of quality vocational education programmes through the Institutes for Technical Education (ITE) and Polytechnics, as well as through private specialized Skill Training Centers (STC).ITE is the principal provider of career technical education and is the principal authority for national occupational skills certifications and standards. ITE Headquarters continues to oversee policy formulation and common functional areas of interest for curriculum development.

**Economic Data**

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<tr>
<td>2012</td>
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</tbody>
</table>

**Key Indicators**

- Population: 5.18
- Education Budget (% of GDP): 4.94

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Issues for comparing VET curricula

- Fragmentation is seen at the national level.
- The education and employment systems appear to be coupled. Social partners are included.
- It should be possible to access VET curricula through the Professional Organizations or the SER.
KOF YLMI Spider Web for Switzerland, the Netherlands and Denmark in 2012
KOF YLMI Spider Web for Hong Kong, Singapore and Canada in 2012
Correlation Between the KOF YLMI and PISA Scores

Figure 4: Group-specific (orange and blue lines) and overall (black line) correlations between the KOF YLMI and PISA scores for the 20 top-performing countries; the size of the dots indicates the available number of indicators; China is used as a proxy for Shanghai because of missing data for the KOF YLMI.
KOF YLMI Over Time for the Two Groups of Top-Performing Countries

Figure 10: KOF YLMI over time for the two groups of top-performing countries
PISA Scores (Disaggregated by Subject) Over Time for the Two Groups

Figure 11: PISA scores (disaggregated by subject) over time for the two groups of top-performing countries
Overview

The three phases of the Feasibility Study

Phase I:
• Analytical framework: Comparing VET Systems
• 2x10 top performer with regard to VET
• Correlation between top performers

Phase II:
• Research Design
Research Design

• Research Questions
• Theoretical Framework
• Analysis of Features of VET Systems (document analysis & survey)
• Classification of VET Systems (construction of Education-Employment Linkage Index EELI)
• Interpretation and Conclusion
• Report II & Outlook to Phase III
Research Questions

To what extent can VET curricula of different top-performing countries and occupations be compared?

- **Governance and Curriculum Value Chain of VET:** To what degree are actors and institutions of the education and employment systems linked?
- What might be the *coordination and control problems* between education and employment systems in different countries?
- **VET curriculum comparison:** Which countries/occupations can be compared?
- What are the *success factors and limits* of a VET curriculum comparison?
Governance: Impact on the Curriculum Value Chain

Actors of the Employment System
- Government
- Schools, providers, Support agencies

Actors of the Education System
- VET multilevel governance

VET «curriculum value chain» expected to maximize EEE

How is it organized and managed by the actors?
What are incentives which stimulate coordination?
What does it deliver in terms of EEE?

Inputs → Process VET
outputs = quality and quantity of delivered E&T
outcomes = educated & trained persons (human capital)
impact = society, productivity, integration, innovation, growth

E = Efficiency
E = Effectiveness
E = Equity
Curriculum Value Chain (CVC): Purpose of VET curriculum is different from a traditional high school curriculum

Distinctive feature: Employer engagement
Education-Employment Linkage Index

CVC Feedback
- Subsidiarity
- Fragmentation
- Transparency
- Social Partnership
- Accountability
- Updating
- Exploring Labor Market
- Method 1-3 (purpose)
- School/workplace-Relation

CVC Application
- Feedback Use
- Monitoring
- Quality Control
- Support Services
- Learning places
- Sharing finance
- Permeability/Portability
- Recognition
- Assessment Validity

CVC - Design

Example (fiction)
Dimensions of Comparison of VET Systems (Fiction)

KOF YLMI

Education-Employment Linkage

Low | Middle | High

KOF

Dimensions of Comparison of VET Systems (Fiction)
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Thank you for your attention!