Promoting creativity and self-efficacy at schools in Japan – challenges to resilience towards the knowledge economy

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The main objectives of the paper are as follows.

1) to identify school education as one of the main problem areas for resilience towards the knowledge economy in Japan

2) to describe some experimental projects we carried out at schools in Japan to promote creativity and self-efficacy in collaboration with Scandinavian countries

3) Even if the feedbacks so far are positive, there are much to be evaluated for further efforts to change the education toward the right direction.

1. The lost decades in the Japanese economy

1.1. The lost decades in the Japanese economy

The Japanese economy since the beginning of 1990’s is often described as „The lost decades“. There are enough evidences for this description.

GDP per capita in Japan was one of the highest in the world at the beginning of 1990’s but is now down to the 18th to 19th in 2006-2008. (World Bank online)

Japan’s share of world’s total GDP was 17.7% at the peak (1995) which is now down to 8%(2007).


Table 1 shows that Japanese economy is behind the other western nations as for transition to service and knowledge economy.

Table 1: Table 1 shares of service sector in GDP and in labor force in some countries
<table>
<thead>
<tr>
<th></th>
<th>SERVICE/GDP</th>
<th>IN LABOR FORCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Japan</strong></td>
<td>70.0</td>
<td>65.5</td>
</tr>
<tr>
<td><strong>US</strong></td>
<td>76.9</td>
<td>72.8</td>
</tr>
<tr>
<td><strong>UK</strong></td>
<td>76.3</td>
<td>68.7</td>
</tr>
<tr>
<td><strong>Denmark</strong></td>
<td>72.4</td>
<td>71.2</td>
</tr>
<tr>
<td><strong>Finland</strong></td>
<td>64.2</td>
<td>63.7</td>
</tr>
<tr>
<td><strong>Norway</strong></td>
<td>55.9</td>
<td>60.4</td>
</tr>
<tr>
<td><strong>Sweden</strong></td>
<td>70.3</td>
<td>68.4</td>
</tr>
</tbody>
</table>

Source: OECD in figures 2009

1.2. **Main factors behind the decline of the Japanese economy**

There are surely a lot of factors behind the decline of the Japanese economy during the last decades. Factors can be found from the macro economic, management and social points of views.

Here I would like to take up a hypothesis of educational problems.

OECD’s PISA (Programme for International Student Assessment) rankings have shown a steady decline of Japan during the last decade.
Table 2  PISA rankings 2006

<table>
<thead>
<tr>
<th></th>
<th>mathematics</th>
<th>science</th>
<th>reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Taiwan</td>
<td>Finland</td>
<td>Korea</td>
</tr>
<tr>
<td>2</td>
<td>Finland</td>
<td>Hong Kong</td>
<td>Finland</td>
</tr>
<tr>
<td>3</td>
<td>Hong Kong</td>
<td>Canada</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>4</td>
<td>Korea</td>
<td>Taiwan</td>
<td>Canada</td>
</tr>
<tr>
<td>5</td>
<td>Netherlands</td>
<td>Estonia</td>
<td>New Zealand</td>
</tr>
<tr>
<td>10 Japan</td>
<td>6 Japan</td>
<td>15 Japan</td>
<td></td>
</tr>
</tbody>
</table>

Source: http://www.pisa.oecd.org/document/2/0,3343,en_32252351_32236191_39718850_1_1_1_1,00.html

A small survey we carried out at schools in Finland and Japan in 2009 shows that Japanese students are less motivated and interested to study at school, less interested in studying or living abroad, less confident in themselves nor own country than Finnish colleagues.

In the Japanese schools, it has been important to memorize facts and figures from the textbooks and to follow the teachers’ classroom education passively without thinking much themselves. Needless to say in the knowledge economy one of the most important missions of the school education is to promote creativity.

School systems in Japan need changes of philosophy and attitudes to the following directions.

- From teaching to learning
- Reflecting needs of the society into school education
- Life-long education

Table 3  Attitudes to study, abroad, futures etc. of Finnish and Japanese pupils

<table>
<thead>
<tr>
<th>percent of students who agree with the statements</th>
<th>4th–6th grades</th>
<th>7th–9th grades</th>
<th>High school pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Finland</td>
<td>Japan</td>
<td>Finland</td>
</tr>
<tr>
<td>Japan</td>
<td>Finland</td>
<td>Japan</td>
<td>Finland</td>
</tr>
<tr>
<td></td>
<td>45%</td>
<td>83%</td>
<td>51%</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>It is fun to study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is safe to live in my country</td>
<td>35</td>
<td>91</td>
<td>62</td>
</tr>
<tr>
<td>I would like to study abroad</td>
<td>19</td>
<td>48</td>
<td>21</td>
</tr>
<tr>
<td>I would like to live abroad in the future</td>
<td>15</td>
<td>45</td>
<td>18</td>
</tr>
<tr>
<td>It is possible to challenge again even after a big failure</td>
<td>55</td>
<td>97</td>
<td>65</td>
</tr>
<tr>
<td>I am satisfied with myself</td>
<td>29</td>
<td>91</td>
<td>26</td>
</tr>
<tr>
<td>It is secure to be at school</td>
<td>42</td>
<td>86</td>
<td>60</td>
</tr>
<tr>
<td>I am worried about my future</td>
<td>48</td>
<td>21</td>
<td>54</td>
</tr>
</tbody>
</table>

N=Japan 225, Finland 161, surveys carried out in the spring of 2009

2. Intellectual Property Education at the Tokai University Educational System

2.1. Tokai University Educational System (TUES)

TUES is one of the biggest private educational systems in Japan. (http://www.u-tokai.ac.jp/international/about/index.html)

Around 30,000 university students are enrolled at 10 campuses all over Japan.

Within the TUES, 14 high schools, 6 junior high schools, 1 elementary school and 4 kindergartens are also located from Hokkaido to Kyusyu with some 15,000 students.

With the firm belief described above that school education in Japan must be changed, a project team of TUES began different experimental projects at the group affiliated schools with a name of the Intellectual Property (IP) Education.

At all the high schools through down to kindergartens of TUES, IP education has been integrated in the curriculum since the middle of 2000’s.

The basic concepts of Tokai IP education are in the figure 1 below.
IP education of Tokai Model endeavors to promote creativity to create intellectual properties, to utilize intellectual properties by entrepreneurship and to respect the intellectual property rights.

2.2. Some cases of IP education at the TUES

In this section some concrete cases and projects of IP education at the TUES will be presented.

2.2.1. Tokai Honda Memorial Kindergarten

Tokai Honda Memorial Kindergarten is located in Isehara City in Kanagawa Prefecture outside Tokyo, near the main campus of Tokai University.

Tokai Honda Memorial Kindergarten holds a so called TIP(Tokai Intellectual Property Education) week every fall to demonstrate the kids’ efforts and attainments on IP education.

Tokai Honda Memorial Kindergarten has been so far carrying out the following projects.

* Eco project

The eco projects began by recycling milk packages to make bookmarks etc. Sales of the products by recycling were far over expectations and the kids wanted to use the funds to plant trees in the nearby forests with local environmental NPOs.
*car project

Kids design concepts of own car and realize them with material and assistance from the professionals from among others Tokai University.

Materials are from simple paper, trees, plastics to batteries and solar cellers by the requests and fantasies of kids.

Tokai Honda Memorial Kindergarten kids visit the Tokai University campus nearby and get professional assistance and advice from engineering specialists etc.

A teacher of Tokai Honda Memorial Kindergarten has also carried out a similar car project at a Finnish preschool in Vaasa 2008. The results showed that Finnish kids are more interested in design while Japanese kids are more interested in mechanics.

*animation project

This has been a project that 1) Japanese kids made animations and Finnish kids added sounds afterwards (2009), plus 2) Finnish kids made animations and Japanese kids added sounds afterwards (2010)

The first work is available on the internet.
http://www.youtube.com/watch?v=3joSg4PQ6Nw
2.2.2. Tokai Daiyon High School in Sapporo

- School market project (2003)

Students were asked to plan, manufacture and market original products at a school festival. Students organized a team with a CEO, managers for product planning, production, accounting and marketing.

Teams were very successful and all the products were sold out after only a couple of hours from the opening of the market.

Students were free to use the profits from the sales. After the discussions they decided to donate the whole profit to the association of guide dogs for the blind which they had contacts before.

- Planning Original Sapporo tours (2004)

Students discussed and designed original Sapporo tours nobody else can market after consulting with travel agencies and guides.

- Vitalizing Sapporo’s Minami-ward (2005)

Tokai Daiyon High School is located in the Minami-ward of Sapporo City.

With the cooperation and advice from the City office, the students worked on different projects to vitalize the Minami-ward like below.

- vitalizing semi-official community associations
- vitalizing the subway terminal area
• Receiving interns from Finland (2005)

Tokai Daiyon High School has received a couple of students and a teacher for internship in Sapporo during two weeks in 2005. Internship is now carried out for all students at the Tokai Daiyon High School and there are discussion to combine school tour with internship in Finland in the future.

**Internship from Finland in Sapporo Oct-Nov. 2005**

*figure 4 Internship from Finland in Sapporo 2005*

• Planning the renewal of the school building (2006)

The school building of the Tokai Daiyon High School is getting old and the students were asked to design the planning of the renewal the building by interviewing the students, teachers and experts.

• Rescue the local bookstores! (2008)

Local bookstores in Japan are facing with keen competitions by huge bookstores, online bookstores and even convenience stores (as for magazines and newspapers).

Students were asked to think out strategies to survive as local bookstores. A successful local bookstore owner was invited as a judge and commentator for the final presentations of students.
Vitalizing Yubari town (2009-10)

Yubari used to be a prosperous town of coal mines with a population of 120,000. The figure is now down to around 12,000 and the town is „bankrupt‟.

Students tried to think about strategies to revitalize the town after meeting with the mayor of Yubari and the other people in and on Yubari.

2.2.3. Tokai University Sapporo campus

Norwegian corner guides at the Sapporo Snow Festival (2005)

Sapporo hosts a famous snow festival in February every year. In 2005, the replica of Stortinget, the Norwegian parliament building was built to commemorate the centennial anniversary of diplomatic relations between Norway and Japan.

Students acted as guides in this Norwegian corner in front of Stortinget’s snow sculpture.
• Shikotsuko Lake Ice festival Vatalizing projects (2006-07)

Shikotsuko Lake is located in the city of Chitose outside Sapporo and holds an ice festival in every winter. Since Chitose has a friendship agreement with the Norwegian city of Kongsberg, we tried to vitalize the Ice Festival with some inspirations and collaborations with Norway.

Below is a Norwegian musician with „ice instruments“ who performed the first ice concert in Japan with a couple of students who assisted him.

![Image](image_url)

**figure 7** The first Ice Concert in Japan

• Hokkaido Style in Linköping, Sweden (2006)

Around 100 people from Hokkaido visited Linköping in Sweden to demonstrate cultures, arts, sports etc.

Students took part in planning, assistance and even evaluation surveys during the events among the Swedish visitors.

• Assisting 20 years’ anniversary of sister cities between Leksand, Sweden and Tobetsu, Japan (2007)

Tobetsu town which lies north of Sapporo has enjoyed a fruitful sister city relation with the Swedish town of Leksand. In 2007 around 80 representatives from Leksand together with the Swedish ambassador visited Tobetsu to commemorate the 20 years’ anniversary of sister cities.

Students acted as guides, interpreters and even planned and hosted a forum to discuss on the visions of towns with special perspectives of nature and environments.
Supporting Culture Night in Sapporo (2008-2010)

Culture night is an event originating from Scandinavia and has been celebrated even in Sapporo since 2003.

Students work as staffs of Sapporo Culture Night secretariat for planning and implementations of the event every year.

3. Works to be left

Main purposes of this paper were to identify problems of school education in Japan and describe some concrete cases and projects we have been carrying out so far.

Evaluations by students who took part in these projects were overwhelmingly positive.
However, there are works to be left to evaluate if these cases and projects can really contribute to increase creativity and self-efficacy in the long term.

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