The New Role of Museums in Encouraging Continuous Learning in the Contemporary Digital Age

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Topics

1. Background

2. Outline of the Project, PCALi

3. Outcome of the Project

4. Challenges
1. Background
Knowledge Circulating Society

• The idea of “knowledge circulating society” have been revised by Japanese government Central Education Council Report, 2008. “Life-long Learning for open up a New age: Pursuing Knowledge-circulating Society”

• People should be able to make the use of what they learned at museums back in their society.
The Positioning of Science

- The society has been changing, the positioning of science in society is also changing.

- After the Great East Japan Earthquake
  - scientists do not have all the answers in the complex situation
  - risk-related issues which can be asked of science, which cannot be answered by science

Science Literacy and Science Communication are vital for people to properly respond to these issues concerning science and technology that face in social life.
Goals of Fostering Science Literacy

**Feel** (Awe and appreciation toward nature)
A scientifically literate person facilitates curiosity and interest toward science and natural phenomena through hands-on activities.

**Know** (Understanding)
A scientifically literate person possesses broad knowledge and concepts in science through programs.

**Think** (Attitudes)
A scientifically literate person comprehends scientific phenomena and current social issues such as environmental problems, learns them by him/herself, interprets and makes judgments on them through identifying and analyzing questions, investigating the solution, and applying scientific knowledge for the daily life.

**Act** (Communication)
A scientifically literate person expresses appropriately what he/she learned to other people. He/she makes decisions using scientific knowledge and attitudes in the social context. He/she transfers knowledge and skills to the next generation. He/she participates in developing a sustainable society by interacting with the social sectors.
<table>
<thead>
<tr>
<th>Generations</th>
<th>Goals</th>
<th>Pre-schooler ~ Lower Elementary School</th>
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</thead>
<tbody>
<tr>
<td>Feel</td>
<td>Awe and Appreciation toward Nature</td>
<td>Feel beauty and wonder of phenomena through scientific activities.</td>
<td>Feel curiosity and interest as well as the relationship between science and the daily life through scientific activities.</td>
<td>Feel curiosity and interest in and usefulness of science through scientific activity.</td>
<td>Be aware of usefulness of science and necessity of science literacy in engaging in scientific activities with the children. Feel interest by engaging in museum exhibits and resources. Demonstrate curiosity and interest that is based on abundant information relating to science.</td>
<td>Feel interest when having a fun experience and interacting with museum exhibits and resources.</td>
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<tr>
<td>Know</td>
<td>Understanding</td>
<td>Feel attainment of being able to understand and do.</td>
<td>Acquire scientific knowledge that directly relates to the daily life.</td>
<td>Broaden understanding of scientific concepts that relates to the daily life and the society.</td>
<td>Acquire scientific knowledge together with the children when engaging in learning. Deepen understanding of scientific knowledge that relates to the daily life and the society.</td>
<td>Acquire scientific knowledge that would be useful to one’s hobbies and the culture.</td>
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<tr>
<td>Think</td>
<td>Attitudes</td>
<td>Engage in an activity by incorporating phenomena of one’s interest.</td>
<td>Have curiosity and interest in natural world and the human society and find patterns and relationships between them.</td>
<td>Select reliable information and make judgments based on scientific knowledge and take actions according to the judgments</td>
<td>Select reliable information and make judgments based on scientific knowledge. Make judgments to solve daily and societal issues by utilizing what is learned as synthetic ability of science.</td>
<td>Make judgments to solve daily and societal issues by utilizing what is learned as synthetic ability of science. Utilize what is learned to one’s hobbies.</td>
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<tr>
<td>Act</td>
<td>Communication</td>
<td>Engage in an activity utilizing phenomena of one’s interest in collaboration with people.</td>
<td>Express what is learned and convey it to people in the way easy to understand. Consider what is learned in relation to one’s career development.</td>
<td>Apply knowledge and skills acquired to the daily life in the interaction with the society. Apply what is learned to one’s career development.</td>
<td>Express what is learned and convey it to people. Identify issues of the local community and find the better solutions for them.</td>
<td>Identify issues of the local community and find the better solutions for them. Pass on the knowledge and the abilities appropriately to the next generation based on the social context.</td>
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2. Outline of the Project

PCALi Project

（Science Literacy Passport β）
What is “PCALi”? 

• It is an interactive online database system to build museum utilization model for lifelong learning.

• PCALi : Passport of Communication and Action for Literacy

• Target Audiences:
  1) the general citizens of all ages
  2) museum staff

• Purpose of project
  ✓ to establish the museum utilization model in which science literacy is fostered in the knowledge circulating society.
  ✓ to establish an interactive lifelong learning system as a new museum function.
Framework and Database

Information of Educational Programs and Meta data

Framework to Foster Science Literacy

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Cited from: Yoshikazu Ogawa, Development of an Educational Program Framework for Science Museum to Foster Public Science Literacy (PCST 2010)
Partner Institutions

Jogjakarta (Indonesia)
- Taman Pintar Science Park

Kansai Area
- Lake Biwa Museum
- Eizaburo Nishibori Memorial Explorer Museum
- Notogawa Museum
- Merchant from Omi Museum
- World Kite Museum
- Gifu Prefectural Museum

Kanto Area
- Natural History Museum and Institute, Chiba
- Ibaraki Nature Museum
- Kanagawa Prefectural Museum of Natural History
- Science Museum
- Chiba City Museum of Science
- National Museum of Nature and Science, Tokyo

Kitakyushu Area
- MARINE WORLD umino-nakamichi
- The Kyushu University Museum
- Museum of Kyushu Sangyo University

Tohoku Area
- mushitec-fukushima

Hokkaido Area
- Asahiyama Zoo
- Asahikawa City Museum
- Asahikawa Science Center
- Obihiro Zoo
- Obihiro Centennial City Museum
- Bihoro Museum

As of June 2016.
New institutions are added at all times.
How to Use PCALi.
Step (1)~(5)
The history of the program which you participated and the questionnaire which you answered

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<th>Feel</th>
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<th>Higher Elementary</th>
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<th>Program questionnaire</th>
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<tr>
<td>Periodic questionnaire</td>
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<tr>
<td>Extra questionnaire</td>
<td>0 times</td>
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How to use the questionnaire table
3. Outcome of the project
Partner institutions in Tohoku Area

- **Institution:** Science Platform in Fukushima, Tokyo Electric Co., and schools
- **Theme:** Radiation
- **Object:**
  1) To understand what radiation is through observation and experiment outside of school.
  2) To learn how to protect ourselves from radiation.
- **Place:** Science Center and community centers etc

Development of the online database system as a function of Science Communication between Museum staff and Museum Users, Yoshikazu Ogawa, Mika Matsuo, Motoko Shonaka-Harada Tsutomo Okada, 13th International Public Communication of Science and Technology Conference, Salvador, Bahia, Programme p.96, 2014
Partner institutions in Kyushu Area

- The 4 institutions in Kyushu collaborated to create a relay workshop.
- The workshop was made of 4 sessions. 1) dance creation by getting the inspiration of museum collection, 2) aquarium making, 3) producing museum shop goods, 4) creating a picture book by thinking back the experiences in session 1 to 3. They took places at all four institutions.

Exhibit: seashell

Subject: glittering

Users comment:
These colorful shells looked glittering to me.

You can find them on the Pacific side beaches.

Program Example: Album Dictionary
Contents of the database (i.e. Educational Programs etc.)

Museum users
- Pre ~ L.E.
- H.E.~J.H.
- H.Sch./H. Edu.
- Families, Prime
- Mid & Old

Museum staff
- Art
- History
- Integrated
- Aquarium
- Science
- Zoo

Personal Passport
(Learning Record)

Survey → Comment → Program

Provide → Program

Comment → Exhibit

Program

Improve

Suggestion of Museum Utilization Models and Sharing Them

Yoshikazu Ogawa (JMMÁ 2013)
4. Challenge

What is Museum literacy (Stapp, C. 1984)

For museum users
“basic museum literacy means competence in reading objects (visual literacy), but full museum literacy signifies competence in drawing upon the museum’s holdings and services purposefully and independently.”

For museum staff/ museums
“the public should be able to draw upon all the resources of the museum purposefully and independently, from exhibitions, publications, and programming to library, study collections, and staff expertise. “
Museum Literacy in the Changes of Digital Landscape

In Science fields

Museum users

Science literacy

Active Senders of Information/Interpretation

Museum staff

Science literacy

Science communication

Management Ability of Digital Contents

Trans-science

Contemporary Digital Age

Open data policy

Training Curriculum for Science Communication / Compliance & Ethics relevant to Personal Rights and so on.
A New Role of Museum in the Contemporary Digital Age

Expert

Trans-science issues

Expert

Lay Public

PUS (Deficit Model)

Lay Public

Science Communication (Dialogue, Interactive)

Local Issues or Resources

Scientific Community

Public

Educational Institute

Government

Industry

Media

Contemporary Digital Age

Open data policy

Science Communication 2.0

知産知承(Chi-San Chi-Sho)

(Knowledge Creating and Knowledge Sharing Model)
See you again! ICOM KYOTO 2019
This work is supported by JSPS KAKENHI Grant Number 24220013. Grant-in-Aid for Scientific Research (S) Title: A Basic Study on Development of an Interactive Life-long Learning System between Public and Museums in a Knowledge-Circulating Society Research representative: Dr. Yoshikazu Ogawa, National Museum of Nature and Science
Contact information: kaken-s-info@kahaku.go.jp
Social Impact of this system:

1. Science Literacy Passport β System (PCALi)

- Growth of Museum users
- Growth of Museum Curators

2. New Challenges and New Museum Utilization Models

3. Generation of Shared Values

Yoshikazu Ogawa (JMMA 2013)
### Number of Educational Programs held at Science Centers and Science Museums (N=962)

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<tbody>
<tr>
<td>Feel</td>
<td></td>
<td>65%</td>
<td>75%</td>
<td>51%</td>
<td>48%</td>
<td>41%</td>
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<tr>
<td>Know</td>
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<td>61%</td>
<td>72%</td>
<td>50%</td>
<td>52%</td>
<td>40%</td>
</tr>
<tr>
<td>Think</td>
<td></td>
<td>3%</td>
<td>9%</td>
<td>8%</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>Act</td>
<td></td>
<td>2%</td>
<td>7%</td>
<td>7%</td>
<td>4%</td>
<td>1%</td>
</tr>
</tbody>
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Cited from: Yoshikazu OGAWA, (2011), working papers of "Action research about the systematizing and structuring of educational programs held at science related museums which contribute to the fostering of science literacy for the construction of knowledge circulating society"
Some types of users

- Having new experience, knowledge and sight and fun
- Educating children in a reasonable cost
- Observing exhibitions as long and careful as they want
- Visiting for a change, refreshing and relaxation

Data: July/2014-Februaly/2015

For more information; Takayasu et al., Interactive Online database system energized by the museums in science themes and humanities themes. ICOM NATHIST 2016