An Interactive Database to Record Personal Histories of Engagement with Science

Yoshikazu Ogawa

National Museum of Nature and Science, Tokyo,

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**

国立科学博物館

National Museum of Nature and Science

Topics

1. Background

2.Outline of the Project, PCALi

3. Type of users; Nomads, Residents

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.

Generations / Goals	Pre-schooler ~ Lower Elementary School	Higher Elementary School ~ Junior High School	High School / High Education	Families, Prime	Middle and Old Ages
Feel Awe and Appreciation toward Nature	Feel beauty and wonder of phenomena through scientific activities.	Feel curiosity and interest as well as the relationship between science and the daily life through scientific activities.	Feel curiosity and interest in and usefulness of science through scientific activity.	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.	Feel interest when having a fun experience and interacting with museum exhibits and resources.
Know Understanding	Feel attainment of being able to understand and do.	Acquire scientific knowledge that directly relates to the daily life.	Broaden understanding of scientific concepts that relates to the daily life and the society.	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.	Deepen understanding of scientific knowledge that relates to the daily life and the society. Acquire scientific knowledge that would be useful to one's hobbies and the culture.
Think Attitudes	Engage in an activity by incorporating phenomena of one's interest.	Have curiosity and interest in natural world and the human society and find patterns and relationships between them.	Select reliable information and make judgments based on scientific knowledge and take actions according to the judgments	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.	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.
Act Communication	Engage in an activity utilizing phenomena of one's interest in collaboration with people.	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.	Apply knowledge and skills acquired to the daily life in the interaction with the society. Apply what is learned to one's career development.	Express what is learned and convey it to people. Identify issues of the local community and find the better solutions for them.	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.

Number of Educational Programs held at Science Centers and Science Museums (N=962)

Generations / Goals	Pre-schooler ~ Lower Elementary School	Higher Elementary School ~ Junior High School	High School / High Education	Families, Prime	Middle and Old Ages
Feel	65%	75%	51%	48%	41%
Know	61%	72%	50%	52%	40%
Think	3%	9%	8%	10%	2%
Act	2%	7%	7%	4%	1%

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"

2. Outline of the Project

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

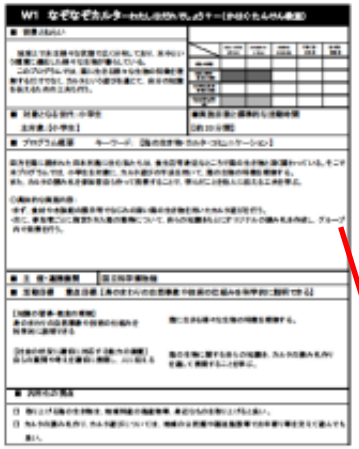
- Target Audiences:
  1) the general citizens of all ages
  2) museum staff

- Purpose of project

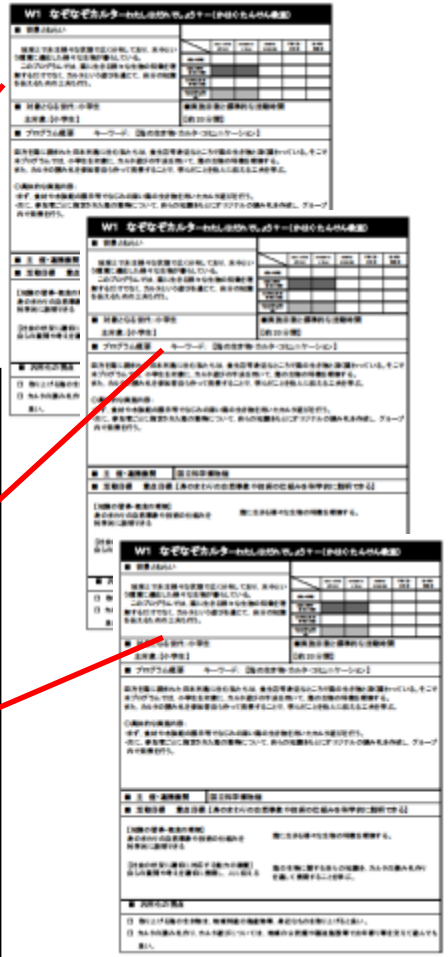
✓ to establish the museum utilization model in which science literacy is fostered in the knowledge circulating society.

✓ to establish an interactive lifelong learning system as a new museum function.

Framework and Database



Information of Educational Programs and Meta data

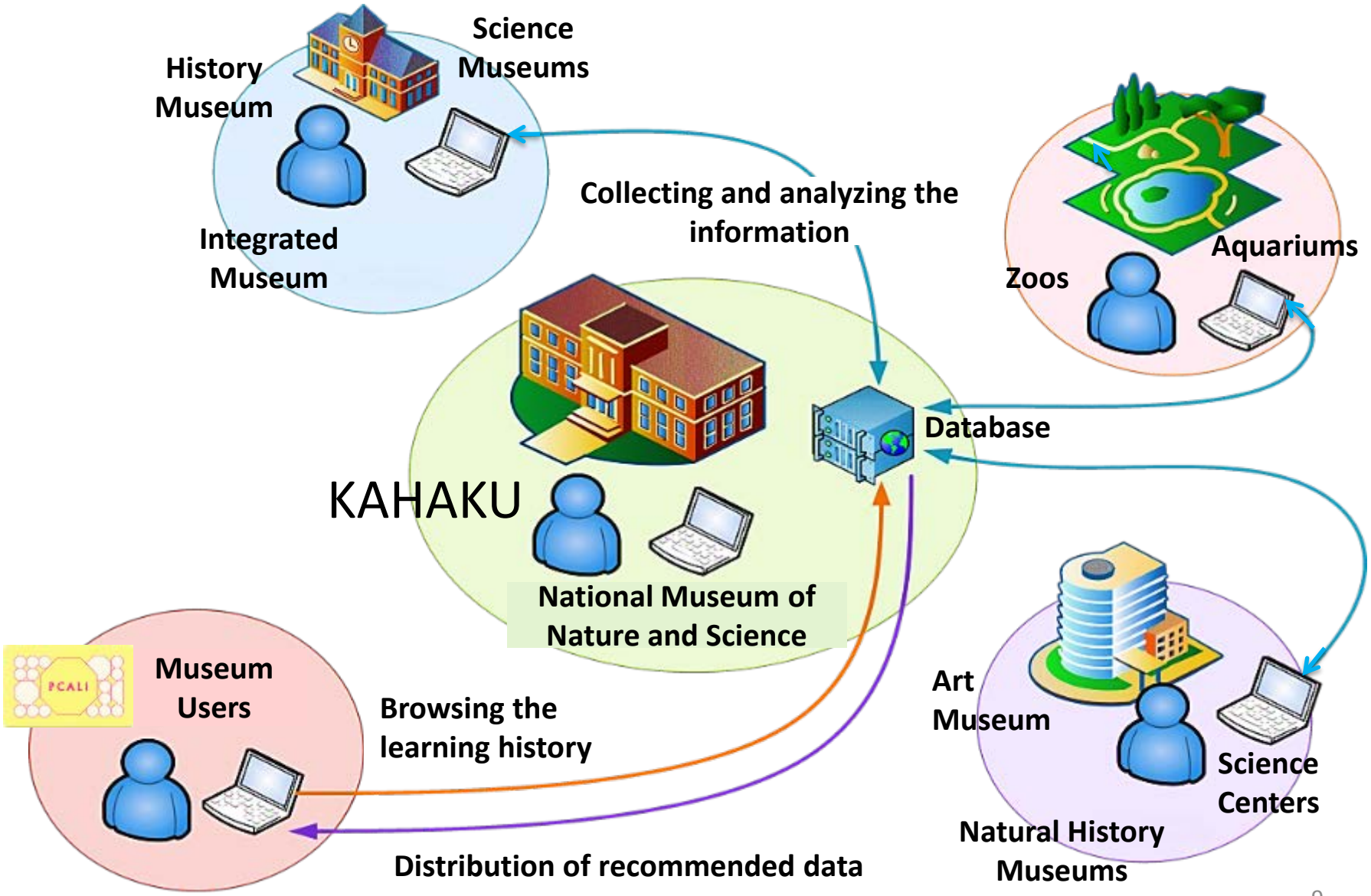


Framework to Foster Science Literacy

Goals \ Generations	Pre-schooler ~ Lower Elementary School	Higher Elementary School ~ Junior High School	High School / High Education	Families, Prime	Middle and Old Ages
Feel	.....	.....	.....	.....	.....
Know	.....	.....	.....	.....	.....
Think	.....	.....	.....	.....	.....
Act	.....	.....	.....	.....	.....

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

The Concept of PCALi



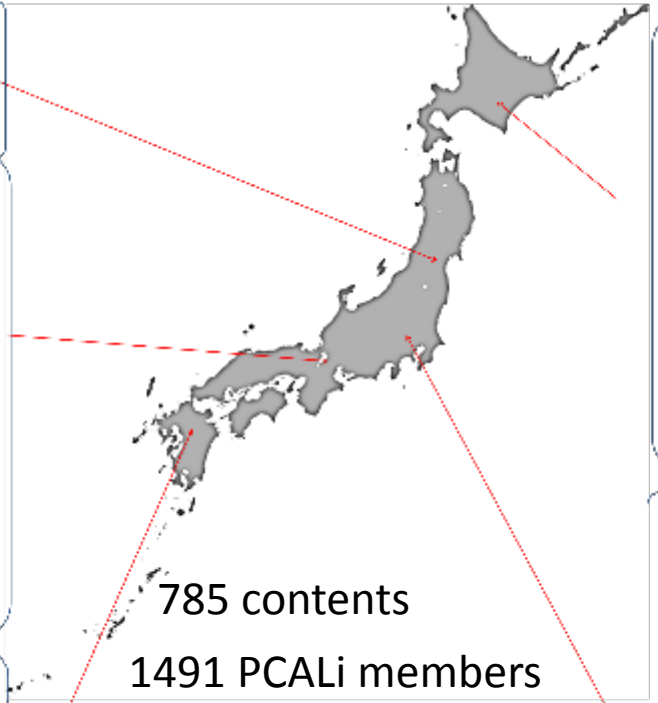
Partner Institutions

Tohoku Area
- mushitec-fukushima

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

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

Jogjakarta（Indonesia)
- Taman Pintar Science Park



785 contents

1491 PCALi members

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

As of March 2017

My Profile

Edit

Name ゲスト 1号
Passport No. 9900000001
Month / Year 5 / 2013
Gender 男性
Live in 北海道

History of participation

2013-07-05 Shiga Peace Museum

2013-06-27 国立科学博物館

The history of the program which you participated and the questionnaire which you answered

Obj. \ Gen.	Preschooler ~ Elementary School	Higher Elementary ~ Junior High School	High School High Education	Families Prime	Middle and old ages
Feel					
Know					
Think					
Act					

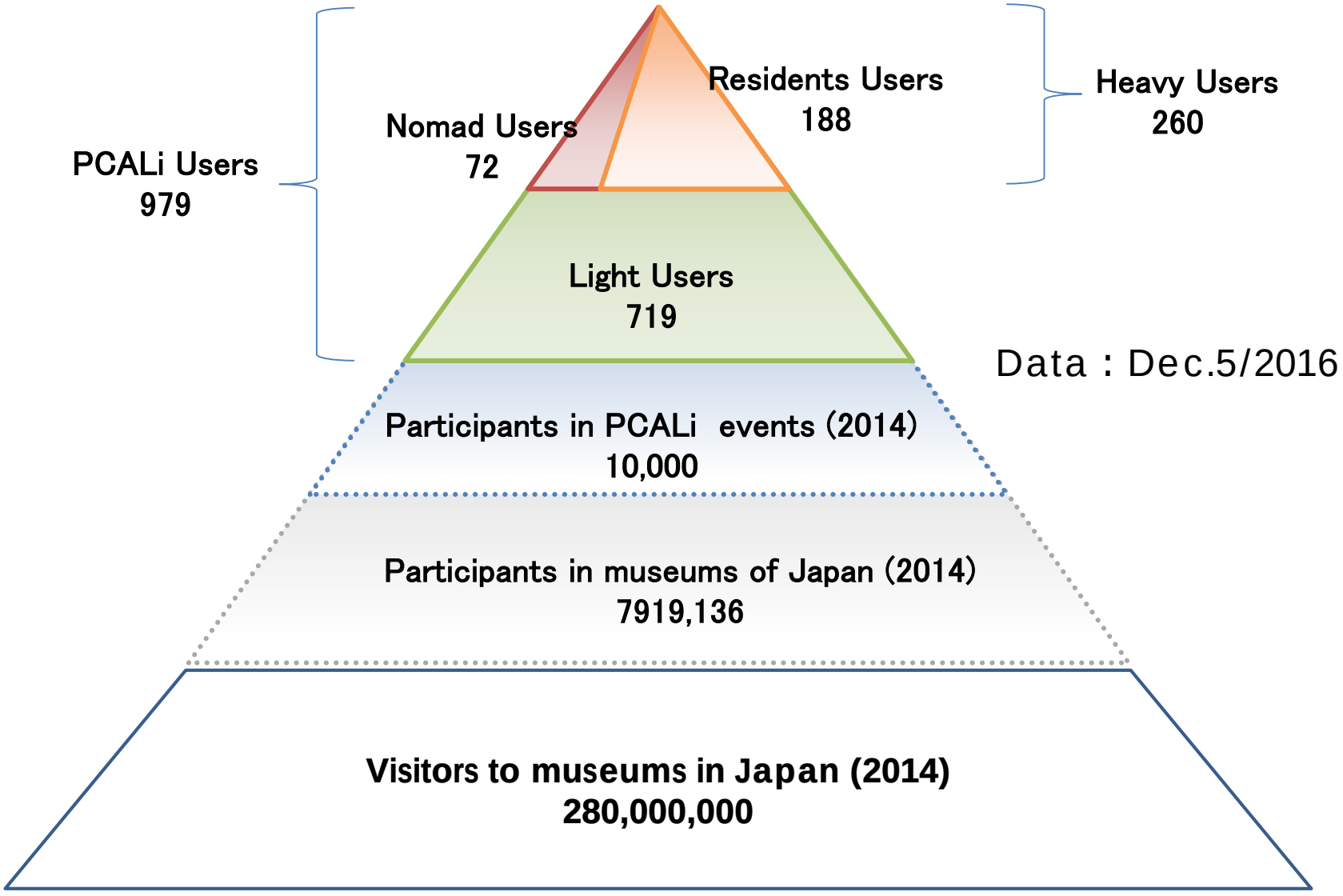
How to use the program table

1pt=Seed 2pt=Sprout 3pt=Stem 4pt=Bud 5pt=Flower

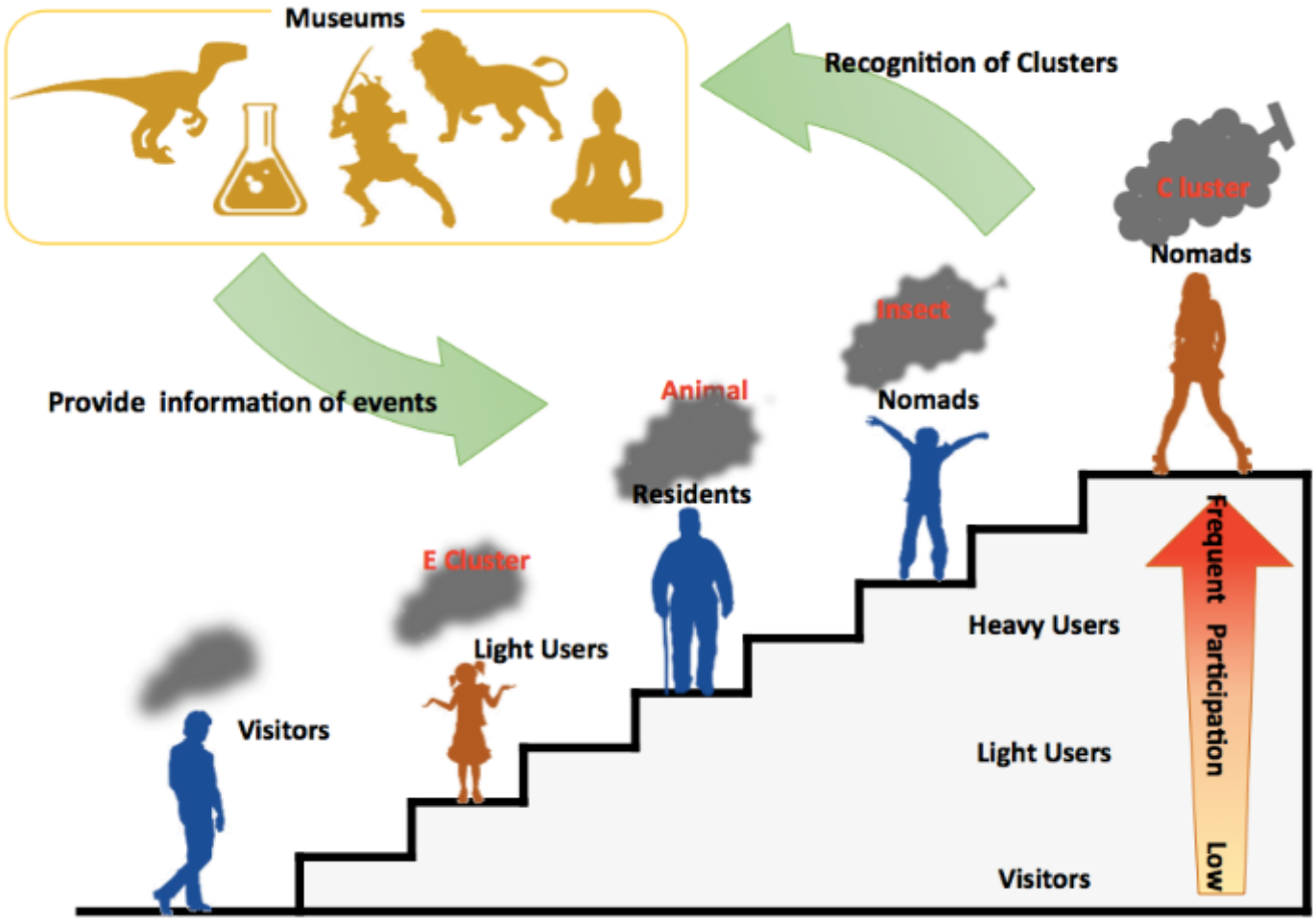
Program questionnaire	0 times
Periodic questionnaire	0 times
Extra questionnaire	0 times

How to use the questionnaire table

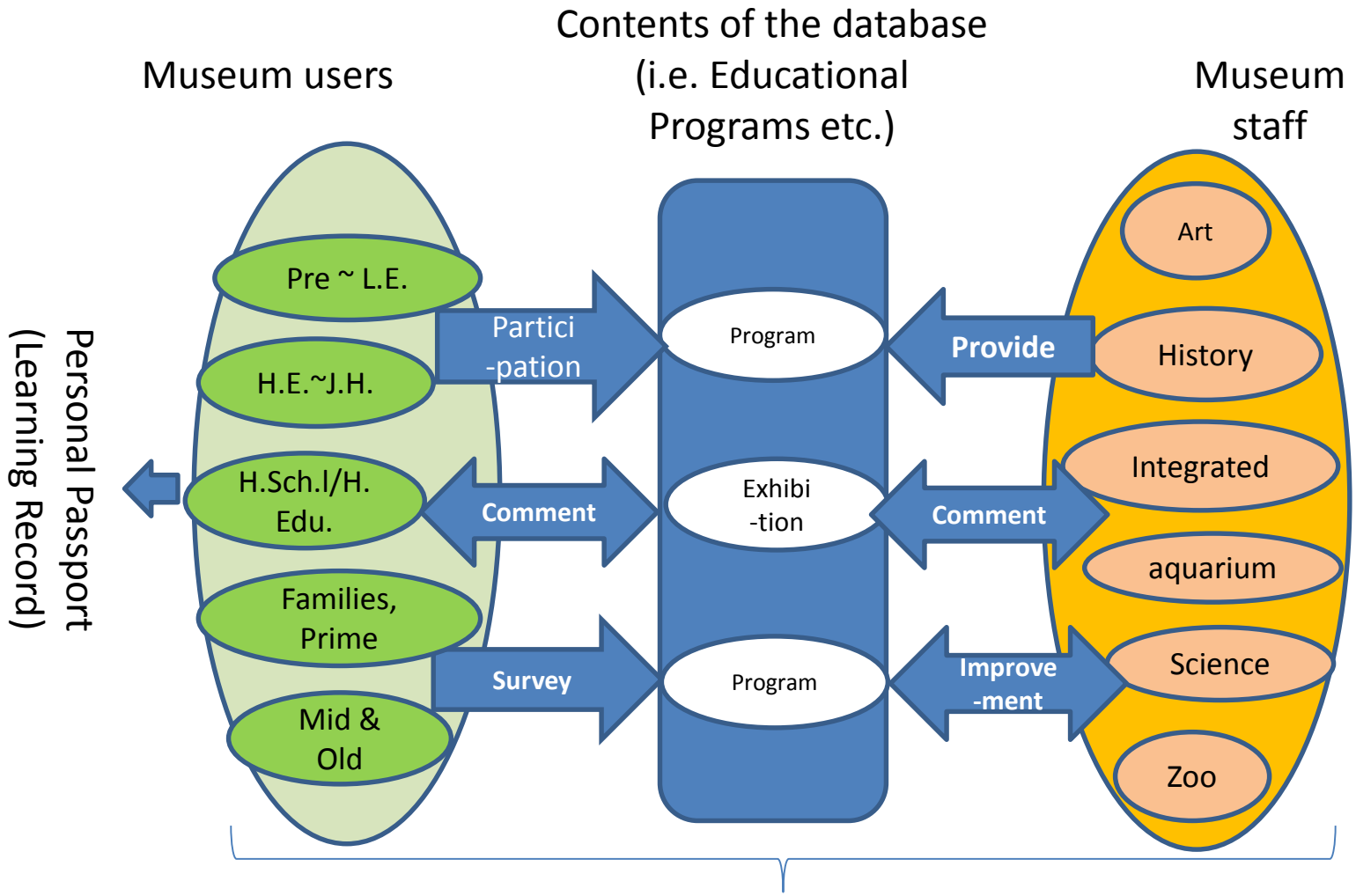
3.Type of users; Nomads, Residents



Development of Individuals' Museum Literacy



Communication between Curators and Museum Users



Yoshikazu Ogawa (JMMA 2013)