

**Development of the online database system as a function of Science Communication
between Museum Curators and Museum Users**

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Abstract

We consider that museum curators are one of the scientists who should have the science communication skill which leads to some sort of social inclusion. This presentation introduces an online database system which can help science communication between museum curators and the public. It is called “Science Literacy Passport β ” and is part of our ongoing research project which started in 2012 at National Museum of Nature and Science, Tokyo (NMNS). The title of this research project is “A Basic Study on

Development of an Interactive Life-long Learning System between Public and Museums in a Knowledge-Circulating Society”. There are two aims of the research. One is to establish the museum utilization model in which science literacy is fostered in the knowledge circulating society. Another one is to establish an interactive lifelong learning system as a new museum function. This paper will discuss how “Science Literacy Passport β ” functions and how social inclusion can be made.

Introduction

The author is currently working on a grant-in-aid research project titled “A Basic Study on Development of an Interactive Life-long Learning System between Public and Museums in a Knowledge-Circulating Society” The purpose of this research is to develop a museum function that contributes to vitalization of the local community and life-long learning. By collaborating with various types of museums and through regional ties, this research will allow easier access and use of resources in various types of museums and promote increased social inclusion with the community. Research activities include the creation of a common framework within the learning resources, such as educational programs and exhibits that are held by various museums, can be brought together in order to foster public science literacy. The users can then utilize this framework to verify their learning outcomes and share their learning methods and achievements. By developing such a system, this research aims to 1) establish the museum utilization model in which science literacy is fostered in the knowledge circulating society, and 2) establish an interactive lifelong learning system as a new museum function.

This paper will first introduce the function of the system, then, it will talk about what sort of influence will be made by the system.

Methodology

In this research, a “Science Literacy Passport β ” system is proposed for identifying individual learning outcomes. A database was developed and operated based on the “Continuous Educational Program Framework to Foster Science Literacy (Table 1)” (which combines generational classification and generational science literacy goals.) and allow museum users to experience the educational programs and check their learning

outcomes. This system is an electronic record used by both the museum users and curators. The users can look at their learning record and the curators can understand the users' learning trends across multiple users.

Table1

Continuous Educational Program Framework
 to foster Science Literacy

Science Literacy's Goal / Life-stage	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

Yoshikazu Ogawa (PCST 2010)

Science Literacy is defined as a cluster of comprehensive abilities in science.

That 1) people possess appropriate knowledge and ways of thinking regarding science and technology, 2) people deal with changes in natural world and human society, and 3) people make reasonable decisions and take actions. Here we would like you to be aware. Though we use the word “Science”, it doesn't mean that we confine this ability only to science context. It includes human society as well.

On this system, the data of museum educational programs are shared between all users. Then, based on the feedbacks from participants, the programs can be improved. Museum Educational Programs data, for example, include the object of the program, target participants, the number of participants we can handle, abstract of the program, the

flow of the program, the items to be prepared and so on. It is something like cooking recipe. Once the data is shared, the programs can be repeated by any museum curators.

“Science Literacy Passport β ” system was launched in July 2013 and now has 18 partner institutions including NMNS (as of April 2014). The alliance is composed of Japanese domestic museums in five areas and a science center abroad to achieve science communication nationally and internationally.

The information is shared online but the whole system is to encourage the citizens to come to museums and it doesn't complete online. Museum users who are involved in this system have a special card called PCALi. It is short for “Passport of Communication and Action for Literacy”. On the back of the card, it has a unique barcode dedicated to each user. When it is scanned, the participation history is recorded on his/her personal account. In addition to that, they are asked to answer online surveys which give feedback to the museums.

Results

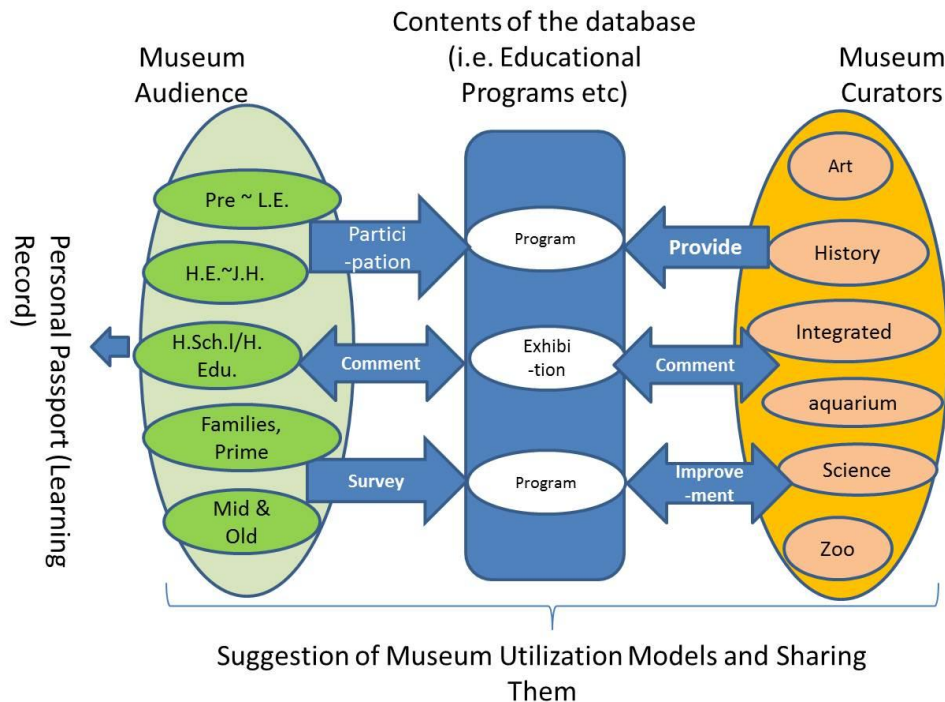
Through this system, users can recognize one's tendencies and motivations in selecting learning resources of museums and evaluate their learning pathways. Museums can use the system as a database to analyze usage trends and extract the public's topics of concern. They can accumulate and transmit museum utilization case examples by topics, generations and museum types.

So far, we have 237 programs' data and 362 PCALi members registered on the system (as of April 2014). Those numbers are still increasing and analysis will be made in the near future.

Discussion

Within the system, educational programs' data works as a media for the communication between museum audiences and museum curators (Figure 1). Museum curators provide programs, museum audience participate in the programs, and both museum audiences and museum curators leave comments on programs' page. Museum audience answer surveys online, and museum curators get the result of the survey and use it as a feedback to improve programs or develop new programs. It can be said that there

are three ways of communication, 1) between museum audience and museum curators, 2) between museum audiences, and 3) between museum curators.



Yoshikazu Ogawa (JMMA 2013)

Figure 1

It is expected that this system will have the following social impact (Figure 2). Within the system, knowledge circulation will be generated. This knowledge circulation can be a kind of power to act on social issues. Those social issues cannot be simply solved by science knowledge. In many cases, it is necessary to understand social sciences as well. Being as one of the members in knowledge circulation, each individual will develop their science literacy and this leads to the finding of new challenges and the creation of new museum utilization models. Finally, we can generate social values. This whole process is the social inclusion and science communication is necessary with all steps. The author considers that museum curators are one of the scientists who should have the science communication skill which leads to social inclusion. It is believed that

this online database system can be a help to generate science communication between museum curators and the public.

Social Impact of this system:

Yoshikazu Ogawa
(JMMA 2013)

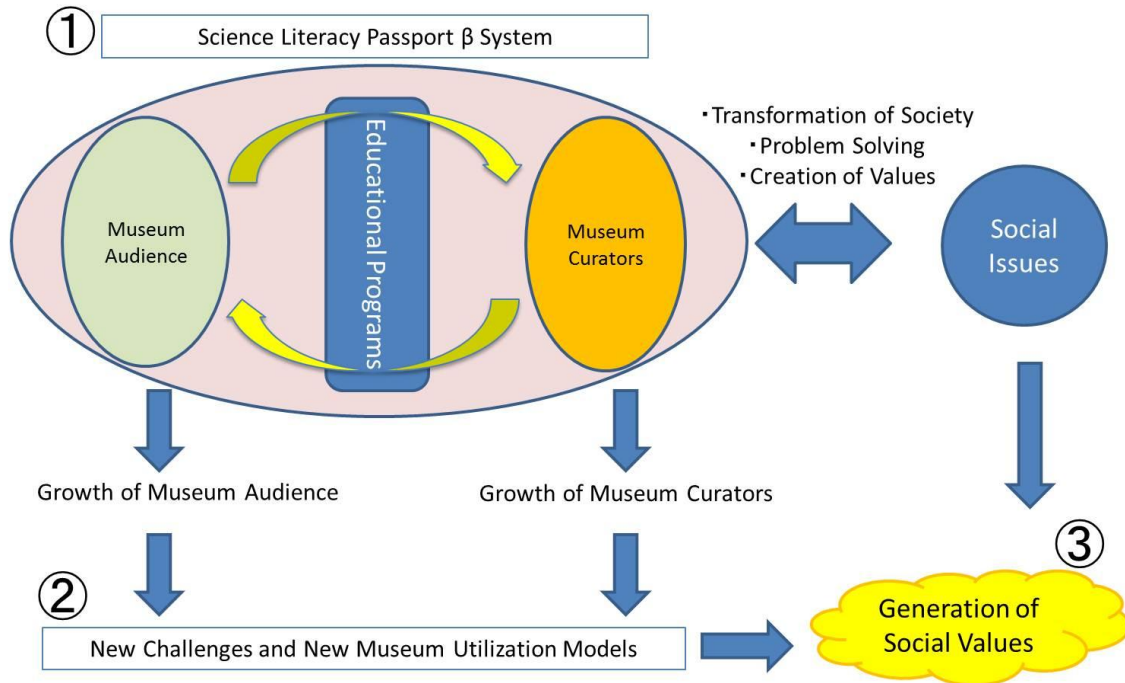


Figure 2

A concrete example should be introduced here. One of the educational programs' data stored on the database is about an outreach program about radiation held in Fukushima prefecture. As it is a well-known fact to the public, after the Fukushima nuclear power plant accident, residents of Fukushima are facing the danger of radiation exposure. This outreach program is for them to learn what exactly radiation is and how to protect themselves from it. The program includes experiment and observation. On this program data's website, some personal comments are left by the participants. They are then replied by the museum curators who held the program. It can be probably said that this communication is the beginning of social inclusion.

Conclusion

In this paper, an interactive online database named “Science Literacy Passport β” was introduced. It stores museum educational programs’ data and make it possible to let them share between museum users and curators. At the same time, it accumulates the data of museum users personal learning history and this supports for the museum curators to analyze the trends of learning and people’s preference in learnings. This system works as a tool to generate science communication between museum curators and museum users. The author believes that science communication skill leads to enhance science literacy and it eventually generate social inclusion.

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