

Proposal for Educational Uses of Museums of Musical Instruments

Yukari Shiota*

1. Introduction

I have been researching effective museum usage for children from ages seven to 11 years. When children visit a museum and view the exhibits, even those who are impressed tend to forget what they have seen once the excursion ends. Thus, they are unable to apply what they have experienced at the museum in their school work. To facilitate the use of museum exhibits for educational purposes and enrich children's experiences, museum curators make various efforts, including providing useful pamphlets and leveraging the Internet. At a museum, for example free do-it-yourself activity sheets and trails are available for young visitors. Virtual museum facilities (24-hour museums) are also offered on the Web.

For children to benefit from museum visits, they require experiences both at the museums themselves and on the Web. Although digital augmentation dissolves many physical barriers, Web visits alone are not enough and children require real-life impressions of the museum setting to be motivated.

I shall discuss effective museum usage by children from the viewpoints of both a database/e-learning researcher and the parent of a seven-year-old child. Although I belong to the Faculty of Economics at Gakushuin University, I am originally a computer scientist and my field is databases. In addition, I have experience in the research and development of digital libraries. I have also been developing an e-learning system for economic mathematics for the last five years and have published the system on our campus network.

The target area of my research is musical instruments at an early age. One of my areas of particular interest is capturing children's responses to different cultures. It is the case that many people from a Western culture are familiar with Western/European music idioms and sounds, but not particularly familiar with Eastern/Asian idioms and sounds. An interesting study would be on ways of teaching these differences at an early age, by gauging young children's reactions to different musical cultures. A more ethnographic study might be to determine how early in life music cultures are embedded within a child's likes/dislikes.

I spent a sabbatical research term as a visiting academic at the University of Oxford, from August 2006 through March 2007. During that time, I was accompanied by my son with whom I often visited museums in Oxford and Europe to study his activity in the museums.

* Faculty of Economics, Gakushuin University, 1-51 Mejiro, Toshima-ku, Tokyo 171-8588, Japan. E-mail: yukari.shiota@gakushuin.ac.jp

In the next section, I describe our museum visits in Oxford and Europe. Following that I describe requirements for the educational use of virtual museum. In Section 4, using my experiences with my son as examples, I describe my proposal for an instruction method for children.

2. Exhibition Policy of the Museum

In this section, I shall describe museums that my son and I visited. At the beginning of my research, Dr H el ene La Rue gave me the following advice: Each museum has its own collection and exhibition policy. It is important to identify and appreciate the differences among them.

We visited the following museums (in order of visit dates):

1. Hamamatsu Museum of Musical Instruments (Hamamatsu, Japan, <http://www.gakkihaku.jp/>)
2. Pitt Rivers Museum (Oxford, <http://www.prm.ox.ac.uk/>)
3. Bate Collection (Oxford, <http://www.bate.ox.ac.uk/>)
4. Horniman Museum (London, <http://www.horniman.ac.uk/>)
5. Ashmolean Museum, The Hill Collection (Oxford, <http://www.ashmolean.museum/departments/westernart/services/index.php>)
6. British Museum (London, <http://www.thebritishmuseum.ac.uk/>)
7. Brussels Musical Instrument Museum (Belgium, <http://www.mim.fgov.be/>)
8. Stockholm Musikmuseet (Sweden, <http://stockholm.music.museum/>)
9. Victoria & Albert Museum (London, <http://www.vam.ac.uk/>)
10. Royal College of Music, Museum of Instruments (London, <http://www.rcm.ac.uk/>)

(A) Bate Collection

The Bate Collection is located in the centre of Oxford, next to Christ Church College and in the same area as the University of Oxford's Faculty of Music*. In their book, *Museums of Music*, Kate Foster and H el ene La Rue note that the historical (mostly wind) instruments at the Bate are available to students to demonstrate how instruments of earlier periods influenced playing style¹. The authors² also note that

Contrary, perhaps, to general impressions, parts or all of several leading specialist

* The Faculty of Music offers its Music Virtual Learning System on a research Web page (<http://www.music.ox.ac.uk/>) for the students. "The system also allows staff to build 'listening lists' for particular courses. It is hoped that the pilot will eventually lead to a fully-fledged Virtual Learning Environment that can be tailored to individual music students' and researchers' needs."

¹ Kate Arnold Forster and H el ene La Rue: Sec. 3.2.5 "Museums of Music", HMSO, 1993.

² Kate Arnold Forster and H el ene La Rue: Sec. 3.2.7 "Museums of Music", HMSO, 1993.

music collections (for example, the Bate, the RAM, the Russell and Fenton House collections) are playable. In the main, these collections benefit from skilled specialist staff who understand the dilemmas involved in keeping historic instruments in playing condition.

Unaware of the staff's dilemmas, children on family fun days have great fun hearing the Serpent and the Russian bassoon played by the staff. My son also had an opportunity to play the Serpent. Later, while reading "The Silver Chair" of the Chronicles of Narnia³, we came across the Serpent in Chapter 3. The experience at the museum helped us to understand the phrases in the book. I think that seeing many musical instruments in museums has made us take much more notice of musical instruments that appear in books and paintings or on ornaments. At the Bate, family educational sessions are also held so that children can learn about the care of historical musical instruments⁴ with their parents.

For my son, the features of the Bate are⁵ as follows:

(1) A harpsichord that belonged to Handel and that was made in 1720 by William Smith

(2) A harpsichord that Haydn played. (Legend has it that Haydn played the harpsichord when he came to Oxford to receive a Doctor of Music degree.⁶)

(B) Pitt Rivers Museum (PRM)⁷

The PRM displays archaeological, anthropological and ethnographic objects from all parts of the world. The PRM is dark inside and great many things are on display. Walking among the exhibits with a torch, we come across many mysterious objects, such as shrunken heads and an African power figure. For us, it was like exploring unknown territory. Every time I opened the drawer under a display, I found many objects. This always made us excited about opening the next drawer. My son lay flat on his stomach on the floor because there were also many objects underneath the ordinary exhibits.

The PRM offers us many musical instruments from around the world. Thus I hoped my son would gain an understanding of the diversity of the world from the exhibits. I referred to a guidebook entitled "Pitt Rivers Museum A Whole Room for Music", when we looked at the musical instruments.⁸ This guidebook is excellent as it is written in plain English so that

³ C.S. Lewis: "The Silver Chair", HarperCollins Childrens Books, Reprint version, 1994.

⁴ Bate Collection: Web site at <http://www.bate.ox.ac.uk/events/familydays.html>.

⁵ Yukari Shirota: "Keyboards Exhibited in Oxford Museums", Private discussion paper, 17th January 2007.

⁶ Jeremy Montagu (New Edition Hélène La Rue): "Bate Guides Keyboards and Strings", The Bate Collection of Musical Instruments, Oxford, 1985.

⁷ Yukari Shirota: "Excursion to Pitt Rivers Museum", Private discussion paper, 27th September 2006.

⁸ Hélène La Rue: "Pitt Rivers Museum A Whole Room for Music", The Pitt Rivers Museum,

children can understand the contents. Although some musical instrument museums offer catalogues of their collections, they do not have such a guidebook for children, to the extent of my knowledge.

Surely at such museums we can learn to appreciate the countless ways of making musical instruments. It is impressive that various materials have been used as or to make musical instruments, including bones (both animal and human), animal skins, horns, shells, and bamboo. In addition, we can see many animal shapes and decorations on musical instruments. This is because people long ago lived in close contact with a variety of animals. We are able to get a glimpse of their ceremonies and events through their musical instruments, when we consider when and how the musical instruments were played. Although the PRM collection is not playable, its educational programme aims to bring children whenever possible into direct contact with instruments and sound-making, through such activities as the gamelan 'Metalworks' workshop for children held at the PRM⁹.

Next, I shall describe the PRM Web services. The PRM offers database searches of photographs, manuscripts, and objects at <http://pittweb2.prm.ox.ac.uk:591/>. The most impressive point for me about the query page is that the search item is written in question form, for example, "What is it called?", "Where does it come from?", and "On display in the Court?" For novice users, including children, this is very helpful. In addition, the location of the objects that the visitor saw in the museum is an important key for the search. I think that the query interface is user-friendly and effective for general users.

Another marvelous feature of the Web service is "Pitt Rivers Museum in 360°" at <http://www.chem.ox.ac.uk/oxfordtour/pittrivers/map.html>, a site which we can enter from the "Have a look at the Displays" corner of the PRM Web site. The comment says, "These interactive web pages allow virtual visitors to explore and manipulate 360 degree photographic panoramas of the Museum interior." I think that the PRM staff have a deep understanding of visitors' requirements. Specifically: (1) They would like to see the exhibition itself to remember it or to feel actual atmosphere even when they are not physically there, but at home, for example, (2) Using the 360 degree photographic panoramas as a query interface, they would like to search for detailed information about the objects. Although the first and second floors have been closed to the public during my stay in Oxford due to reconstruction, I was pleased to be able to see the floor exhibitions on the PRM in 360°.

(C) Horniman Museum¹⁰

Oxford, 1991.

⁹ Kate Arnold Forster and Hélène La Rue: Sec. 4.2 "Museums of Music", HMSO, 1993.

¹⁰ Yukari Shirota: "Horniman Museum Children and Families Activities titled "Hands On Our Musical Instruments", Private discussion paper, 9 September, 2006.

Of the UK musical instrument museums we visited, only at the Horniman Museum and the PRM were we able to see many musical instruments from around the world. In other countries, we found that the Brussels and Hamamatsu musical instrument museums also offer broad international collections. When I wrote a report concerning African musical instruments^{11,12} both the PRM and the Horniman Museum helped me greatly. Before visiting the music gallery at the Horniman, we repeatedly found the Horniman noted as the owner of items pictured in instrument books^{13,14}. Thus, we were pleased to find the same instruments as we had seen in the books at the museum. Because the Horniman is located in Forest Hill, which is a long, half-hour train ride from Victoria, London, and because there are no other museums nearby, the museum is not crowded and it is possible to appreciate the musical instruments there leisurely.

On 9 September, 2006 we attended the Children and Families Activities titled "Hands On Our Musical Instruments" held at the museum. The activity is like a cushion concert for children, with the children sitting on the carpet and their parents in the chairs around them. The children, whose number was limited to eight, were given an opportunity to freely play the talking drums, lamellophones (thumb pianos), balaphones (percussion instruments), and shakers, such as rainmakers. Then the instructor with the lamellophone told us the following things, while asking the children questions:

1. The lamellophone is made of recycled items. The keys are hammered out of recycled scrap iron, such as bicycle shafts.
2. The lamellophone's original name is "mbira dza vadzimu" which means 'notes of the ancestral spirits' and it is traditionally used in (religious) ceremonies. For example, when a baby is born, more than 10 people play the instruments together.
3. If the lamellophone is played inside a gourd resonator, the sounds get louder.

I had neither seen nor heard the lamellophone being played properly before that. The sounds comforted me. In addition, I was surprised to hear the big sounds of the lamellophone with the resonator. The advantages of this live presentation for children were as follows:

1. They could listen to the actual instruments and hear their proper sounds as the instruments were played by professional musicians specializing in them.
2. They were given the opportunity to play many African instruments.
3. They received explanations on the cultural background of the instruments. This enabled the children to think about the players of the instrument and their lifestyles:

¹¹ Yukari Shiota: "African Chordophones", Private discussion paper, 9 December, 2006.

¹² Yukari Shiota: "The Talking Function of African Drums", Private discussion paper, 12 December, 2006.

¹³ Diagram Group: "Musical Instruments of the World: An Illustrated Encyclopedia", Facts on File Inc., October 1976.

¹⁴ Alexander Buchner: "Folk Music Instruments", Octopus Books, 1971.

The explanations answered the following questions: "When does the player play the instrument?" "What is the purpose of playing it?" Thanks to the instructor's explanations, we became interested in the instruments and felt the desire to study more about the countries of their origin and the lifestyles in those countries.

Let us return to the music gallery exhibits. There we are able to see a large number of musical instruments from around the world. There are two tables in the gallery room. Museum visitors are allowed to listen to the sounds of the instrument; the projector installed on the ceiling can display computerized images on the table desk. It is good that we can listen to the sounds as we can observe the actual musical instrument in front of us. The IT facilities provide us wonderful modern conveniences. The guidebook titled "the RHYTHMS of LIFE" offered explanations of the collection's highlights and was helpful¹⁵. The Horniman is much further from Oxford than the PRM. I wish I could visit the Horniman more easily because I would never tire of looking at the exhibits even if we were to go every day.

(D) Ashmolean Museum, The Hill Collection¹⁶

Here, we can see a violin made by Antonio Stradivari (1644?-1737), as well as a guitar and a cittern that he also made. Nicola Amati's violin is also on display. These instruments are for preservation in their original form, not for playing:

The Hill Collection is a collection of violins, and other stringed instruments, formed in the 1930s by the Hill family firm of violin makers and restorers and hence the Hills were able to appreciate the need to preserve an historic record of instruments that would provide future generations with evidence of original makers' work¹⁷.

Although my son understands the collection policy that "this is a place for preservation", he said that he would still like to hear the sounds of these Stradivari stringed instruments. Because these are such valuable instruments, I wonder how much they are insured for.

Other than the Hill collection, I like the ornaments with musical instruments, such as the viol and the hurdy-gurdy, in the pottery corner. We can get a sense of the players' lives from them.

(E) Brussels Musical Instrument Museum¹⁸

¹⁵ Horniman Museum: "the RHYTHMS of LIFE", JAAROLD publishing, 2002.

¹⁶ Yukari Shirota: "Stradivari's Stringed Instruments at Ashmolean Museum", Private discussion paper, 20th October 2006.

¹⁷ Kate Arnold Forster and Hélène La Rue: Sec. 1.2.8 "Museums of Music", HMSO, 1993.

¹⁸ Yukari Shirota: "Brussels Musical Instrument Museum Visit, Private discussion paper, 10th October 2006.

We visited this museum on 1 October 2006, taking the Eurostar directly from London to Brussels. I think the key feature of this museum is its headphone facilities. Thanks to a sensor and wireless connection, the visitor can listen to the sounds of any one of the numbered instruments when he/she stands in front of it. The point is the excellent sound contents, not the IT facilities. The music selected and recorded by the museum was so impressive that we were happy to listen intently to each instrument while looking at it. The content of the recording includes not only the sounds of the instrument but also a piece of music and the sounds of several instruments played together and background sounds, such as dancing and laughing, which enable us to imagine the performance environment. The sounds often made my son begin dancing in front of the exhibitions. Because he concentrated so hard when listening to the various sounds of the musical instruments, at night in his bed he said he could still hear them in his head. Certainly there were many sounds that we had not heard before.

The Serpent, the Russian bassoon, and the Buccin trombone are all displayed together because they all have snake heads or shapes. My son calls these three the "Serpent trio". In the Chinese instrument corner, we were able to see the Gyo, which is in the shape of a white, tiger-like animal. Because he had seen a similar one at the Hamamatsu, he was pleased to see the one in Brussels.

The most impressive exhibition was the violin maker's workshop. Seeing this room makes the visitor feel like he/she is in the actual workshop of a violin maker in Renaissance Italy. The exhibit reminded me that a good violin is made almost completely by hand. There was also a harpsichord workshop room, although it was under construction. Seeing the saxhorn with seven bells, my son asked me how to play it. When I told him that although it has seven bells, it is only possible to play one bell at a time, switching the valve, he was disappointed. The piano corner was magnificent, made even more posh by the set of eight Serpents adorning it.

In the mechanical musical box corner, we could see the Componium, which is a music box with a cylindrical mechanism and the ancestor of the current computer: "The instrument can imitate a small orchestra and plays from a barrel (stepped drum) and represents a fine example of preprogrammed processes. Looking at the layout of the music 'program' it looks like a binary notation."¹⁹ I was surprised as I never dreamed I would be able to see the ancestor of the computer at the Brussels museum.

There was a cozy restaurant on the top floor of the museum building, which was originally a department store named Old England. Appreciating beautiful musical instruments and their sounds, in addition to a good lunch with a nice view, we hoped that we would have the chance to visit the museum again sometime.

¹⁹ The history of computing project: <http://www.thocp.net/index.html>

(F) Stockholm Musikmuseet²⁰

The special feature of this museum is the sound room where there are many playable musical instruments, including the harp, the synthesizer, the electrical guitar, and the dulcimer. Both my son and I were excited to play these valuable instruments. It was the first time I had ever touched a dulcimer. It was impressive. My son was attracted to some electrical drums and an African drum. Children of his age love to play percussion instruments. The musical instruments are soon worn out because the children play them so hard; they use the bows of the string instruments like saws, for example. However, playing the actual (not virtual) musical instruments is really enjoyable and the most impressive experience for children.

The Nyckelharpa displayed was wonderful because it is the representative musical instrument of Sweden. The violin maker workshop exhibit was also interesting.

(G) Victoria & Albert Museum²¹

There is a music room in the Victoria & Albert museum (V&A). The authors of "Museums of Music" said, the following.²²

The collection, which specializes in the Western art tradition, forms part of the Department of Furniture and Woodwork, and as such is regarded primarily for its importance as a collection of outstanding examples of design and cabinet making. Although held primarily as outstanding examples of design and cabinet making, the V&A's collection of mainly Western instruments is also of great musicological importance.

In 1956 the fine folk instruments and oriental art instruments of the V&A were transferred to the Horniman Museum. These, together with the original Frederick J Horniman gift and those of the Bull, Carse and Dolmetsch collections, amount to a collection of around 6,000 instruments that has some claim to being more comprehensive than any other in the UK.

We obtained a copy of the instrument catalogue²³ before visiting the museum and checked

²⁰ Yukari Shirota: "Musikmuseet at Stockholm", Private discussion paper, 10th October 2006.

²¹ Kate Arnold Forster and Hélène La Rue: Sec. 5.2 "Museums of Music", HMSO, 1993.

²² Kate Arnold Forster and Hélène La Rue: Sec. 5.2.4 "Museums of Music", HMSO, 1993.

²³ James York: "Catalogue of Musical Instruments in the Victoria and Albert Museum", V&A Publications, 2002.

those that we wanted to see. They were (1) Annibale dei Rossi's beautifully decorated spinet set, (2) Queen Elizabeth's beautifully decorated virginal, (3) Antonio Stradivari's violin, (4) Wendelin Tieffenbrucker's chittarone, and (5) Cristoforo Choco's archlute or theorbo. Rossi's spinet is very famous as the most valuable instrument because it is inlaid with 1,928 precious and semi-precious stones, including turquoise, lapis lazuli, topaz, emerald, sapphire, garnet, pearl, amethyst, jasper, cornelian and ruby.²⁴ When I asked my son about the gorgeous spinet, his answer was, "I would like to have it because I would like to play it. It must sound like a stone, which must be completely different from a normal keyboard, because the keyboard notes are made of many stones." I found that a child will instinctively want to play an instrument when he/she sees it even if it is so materially valuable.²⁵ We could not find Annibale dei Rossi's spinet in the music room, but later found it in a different gallery related to European arts.

For me the most impressive instrument was the harpsichord made by the Ruckers family, 1631. The soundboard is decorated in gouache with flowers and animals. On it I found a small and lovable group of monkeys that seemed to be playing and learning music. As I do not know of any other musical instruments with monkeys painted on it, I was very impressed by this one.

(H) Royal College of Music (RCM), Museum of Instruments

This museum is mainly for students at the college and is not open to the public like other museums. I made an appointment to see the collection and obtained the catalogues^{26,27,28} in advance. Because children are not allowed in the museum, I went by myself. The building's atmosphere was very much that of a music college. I was lucky, as the Curator of Musical Instruments, Ms Jenny Nex, explained the details of the instruments to me. I have heard that the conservator regularly visits the museum to keep the instruments playable. I wonder whether only a few select students are allowed to play these valuable instruments.

I was able to see a clavicytherium (southern Germany -- ?, 1480) which is a very old keyboard, and a chitarrone made by Mango Tirffenbrucker (Venice, 1608). The RCM collects mainly western art music but there was also a corner for Asian and African instruments. I was so pleased to see a wonderful African lyre there.

²⁴ Rene Clemenicic: " Old Musical Instruments" , Octopus Books, 1973.

²⁵ Yukari Shirota: "Keyboards Exhibited in Oxford Museums", Private discussion paper, 17th January, 2007.

²⁶ E.A.K. Ridley: "Royal College of Music Museum of Instruments Catalogue Part I European Wind Instruments", Royal College of Music, 1982.

²⁷ E.A.K. Ridley: "Royal College of Music Museum of Instruments Catalogue Part Ia European Wind Instruments: Addenda including the Hartley Collection", Royal College of Music, 1998.

²⁸ Elizabeth Wells (edited): "Royal College of Music Museum of Instruments Catalogue Part II Keyboard Instruments", Royal College of Music, 2000.

(I) Hamamatsu Museum of Musical Instruments²⁹

Even after having seen great musical instrument museums in Europe, I felt very proud that Japan has such a splendid musical instrument museum. The exhibition concept of the Hamamatsu Museum of Musical Instruments is “To exhibit and introduce musical instruments from around the world on an equal basis without prejudice and from the same viewpoint.” As the concept says, there are also many Asian and African musical instruments on exhibit. In addition, wonderful keyboards, such as pianos, harpsichords, and clavichords, are exhibited, perhaps because Hamamatsu is where musical instrument makers Yamaha and Kawai were founded. At the museum, we can listen to explanations about the instruments and their sounds using earphones. After pushing the exhibit number on the hands-on equipment, we push the start button to listen. There are also PC corners where visitors can appreciate videos of the musical instruments.

The most attractive corners for my son were the experiential corners where he was allowed to play the instruments. There he was pleased to be able to play the raft-shaped zither, called a Tiawoun, from Burkina Faso, Africa. The explanation said that a tourist in the country had continued to walk playing the Tiawoun, encouraging himself with the music. My son also said that he would like to walk to a far away country with a Tiawoun. Since then his dream has become to go to Burkina Faso to obtain a Tiawoun. After the visit, Prof. Gunji told me how to make a Tiawoun from bamboo, a process that seemed not to be so hard for us. My son's other favourite instruments at the museum were the Jagog (Bali, Indonesia) and the Javanese Gamelan Bonang (Indonesia).

Another feature of the Hamamatsu is that it provides many published brochures for special exhibitions, such as “Musical Instruments of Mexico & Guatemala”. These brochures are very useful to help children understand the geographical information and the life styles of people in other countries in addition to their musical instruments.

(J) British Museum³⁰

Although the British Museum is not a musical instrument museum, it can greatly inspire children concerning musical instruments. On 20 September, 2006, as a volunteer parent, I helped teachers take a group of Cutteslowe Primary School students in Years Three and Four (about 35 pupils) to the British Museum. We saw the following exhibitions on the main floor: Greece and Rome, the Ancient Near East, and Egypt. The British Museum is very big, and so although we saw only these exhibits, we became very tired owing to their grandeur.

²⁹ Yukari Shirota: “Report of Visiting Hamamatsu Museum of Musical Instruments”, Private discussion paper, 16 June, 2006.

³⁰ Yukari Shirota: “Report of British Museum Excursion”, Private discussion paper, 21 September, 2006.

Before our visit, we searched the British Museum site to locate the oldest musical instruments: <http://www.thebritishmuseum.ac.uk/compass/>.

The “assignment” that I gave my son in advance was: Let’s find the oldest musical instrument. I wish he were able to understand that human beings in ancient times also loved music and to play musical instruments. I think that exhibits not related to musical instruments help him imagine ancient culture. Seeing the Assyrian and Greek art helped him to understand the description in the book: “In most ancient civilizations, musicians were thought very important, second only to the kings and priests. This was true in Assyria.”³¹

The oldest musical instruments that we identified and wanted to see were the following:

1. A Sumerian lyre (around 2600 BC) which is richly decorated with gold, lapis lazuli, shell and red limestone.³²
2. An arched wooden harp (1550-1069 BC) which was found in a tomb in Thebes, Egypt³².

After the excursion, through Prof. Gunji’s paper³³ I read an article about the instrument pictured on the relief of an Assyrian palace called Nineveh and which discussed whether the musical instrument is a Dulcimer or a Horizontal Harp.³⁴ I am afraid that I missed the instrument in the relief on the visit.

Through my experience with the primary school pupils, I felt the following:

It may be helpful for children to take snap photos themselves while visiting the exhibits. If it is impossible or impractical, it would be ideal if the museum would offer them some photos for their convenience. At home or at school, it would be ideal to have PCs and color printing facilities to enable the children to print out their favourite photos because visual memos are effective.

3. Requirements for Virtual Museums for Educational Use

In this section, I shall discuss an ideal excursion plan for a musical instrument museum.

From our experiences visiting museums, I would like to request the following of museums:

- (1) I would like to be able to listen to the sounds of each instrument in front of the instrument itself.
- (2) I would like to be able to touch and play the instrument if at all possible.
- (3) I would like to be provided with objective detailed information in front of the

³¹ Simon Mundy: “The Usborne STORY of MUSIC”, Children’s Britannica Science and Hobbies, Usborne, 1980.

³² Katharine Wiltshire: “The British Museum Pocket Timeline of Ancient Mesopotamia”, The trustees of the British Museum, 2005.

³³ Sumi Gunji (edited): “Zither”, Kunitachi College of Music, Collection for Organology, 1994 (in Japanese).

³⁴ T.C. Mitchell: “An Assyrian stringed instrument”, The British Museum Yearbook 4, Music and Civilization, pp. 33-42.

instrument itself.

(4) I would like to be able to access the virtual museum/database on the Web after returning home or to school.

These are our basic requirements. My main point is that listening to the sounds of each instrument while standing in front of and looking at the instrument itself would be much more effective than only watching a video in a location separated from that of the actual instruments. When I asked Prof. Gunji about the key factors for a musical instrument museum, she answered as follows³⁶:

(A) It is most desirable that museums offer an environment with simple instruments, where children can make instruments by themselves and listen to the sounds. Such experiences would make children interested in sounds.

(B) The museum should offer children opportunities for concentrated listening. Whatever the target, concentrated experiences are important for children.

The following is Prof. Gunji's comment, which I received as a private communication:

In an IT-facilitated museum, children tend to be more interested in the IT facilities than in the actual sounds and musical instruments, because devices such as television and TV games are familiar to children. I am afraid that many museums think that IT devices are more effective methods of providing children with a lot of information and try to install these devices in their museums. It is, however, more important that visitors be able to touch the actual musical instrument using their five senses. Therefore we should offer visitors many opportunities to experience the actual sound and feel of a musical instrument and the smell of the material, although it is very difficult to offer visitors such opportunities. (The smell of a musical instrument depends on the materials used and the construction method. Therefore visitors can feel and identify regional and cultural differences by smell.) We should offer actual experiences to visitors as much as possible. Activities such as generating the sounds of an instrument or making a musical instrument themselves would help children feel the differences. I (Prof. Gunji) think it is preferable that we use virtual reality devices to supplement actual experience. A lack of actual experience in everyday and school life necessarily leads to many of the indecent troubles and incidents which occur these days.

Because I am originally a computer scientist and my field of specialty is databases, I tend to

³⁶ Yukari Shirota: "For What Shall We Construct a Virtual Museum for Musical Instruments" (This report is a memo that I wrote based on Prof. Sumi Gunji's talk held on 9th May 2006.) Private discussion paper, 8th June, 2006.

think about multimedia database construction as a primary matter. However, children should first visit actual museums as much as possible. Virtual museums and multimedia databases should then support their actual museum excursions. I think that Prof. Gunji's comment taught me something very important concerning the purpose of/policies on virtual museum construction.

Let us consider the more technical points on requirements.

I believe that one purpose of school museum visits is to have children collect data that they will later organize and analyze to identify underlying general principles or concepts. By leveraging the Internet to view artifacts on display at a museum, children can use various indices to view the artifacts from a range of viewpoints. By laying those artifacts out, children should be able to compare the data and arrange them visually and interactively. Data indices include scientific data indices, such as artifact size or chronological data. In addition, I think that indices concerning children's first impressions are also important for the data analysis. For example, the degree of a child's interest (high to low) in an artifact and the extent to which he/she finds the artifact appealing (high to low) are valuable. Recording such personal impressions helps make the artifacts viewed memorable for children.

Therefore a visual tool would be required for the analysis. In addition, a back office (multimedia database) system would also be required and the data schema would have to be well designed to meet children's requirements. The necessary attributes/indices would have to be identified and incorporated into the system in advance.

Using pervasive technologies, it is possible to conduct ubiquitous analysis in museums. For example, children with PDAs could visit many museums to view the exhibits and collect data about the artifacts in them. The technical point would be how to make the associative link between an actual object and the object index/ID in the database. At museums today, we sometimes cannot read handwritten index tags attached to objects on display. To eliminate the inconvenience, we need a method of obtaining an object's ID. Then, using the object ID, we can access detailed data about the object stored in the database. For example, the Brussels museum uses automatic sensors so that the sound of the object automatically plays when the visitor enters the object territory/range. I am optimistic concerning the technical side, because technical progress will be able to solve many problems.

Suppose that children were able to obtain the ID of objects that they had seen in a museum. Later at home/school, they would be able to access the data needed from the virtual museum on the Web.

Another problem is "How children would find the virtual museum data on the Web". Although such data should be readily accessible, they could have difficulty finding it owing to the enormous number of objects. Children could end up getting lost in a sea of data because they are unable to retrieve the needed data correctly. This is partly because children

of seven through 11 years of age do not yet have the ability to select the appropriate retrieval keywords to find the data they need. To solve this problem, images of the museum would be useful. My idea is to take a video for the duration of the excursion, at most one or two hours, from the viewpoint of each child. Using sensing technologies, it would be possible to embed the object IDs in the video data. Then, using the recorded video data, a child could access an object in the virtual museum on the Web. Another good example of query interface is the Pitt Rivers Museum 360°. (<http://www.chem.ox.ac.uk/oxfordtour/pittrivers/map.html>). Their future plan is to allow Web browsers to access further information about the museum's diverse displays.

I think that a database query using the actual exhibition positions would be helpful for children.

4. Instruction Method

In the section, I shall describe an instruction method problem. The problem is "How can school teachers/parents get children interested in museum exhibits and help them learn something (namely identify underlying principles/theories) by analyzing museum artifacts?"

I think that if children were given an "assignment" in advance, they would become more interested in seeing the exhibition. Although I am not sure whether or not these would be effective for children in general, following are the methods that I tried on my son's visits.

- (1) Usage of visual materials, such as portraits of great composers.
- (2) Studies of the geography and history of the region.
- (3) Comparisons between European and Asian/African instruments.
- (4) Questions concerning his favourite instruments and why he liked them.

4.1. Usage of visual materials³⁷

To get children interested in great composers and their masterpieces as well as in musical instruments, I would like to propose a method whereby we start giving explanations about the great composers at the time we view the actual museum exhibits. I think the visual impact of the exhibits would be significant. If some of the exhibits were related to famous historical persons it would be more effective.

A good example of this kind of instruction involves Handel's 1720 harpsichord in the Bate Collection. The collection includes a portrait of Handel by Philip Mercier in which the composer, quill in hand and with a manuscript on the table in front of him, is leaning on a single-manual harpsichord. "The harpsichord in the portrait is almost certainly Handel's

³⁷ Yukari Shirota: "Keyboards Exhibited in Oxford Museums", Private discussion paper, 17th January, 2007.

own, as it is unlikely that he would have wished to be shown in a portrait with an instrument that had nothing to do with him; indeed, the music in front of him in the portrait may even be sketch work for the keyboard suites published in London in 1733³⁸.

In front of the portrait and the harpsichord, I asked my son the question, "Do you think the harpsichord in this portrait is this harpsichord?" His answer was, "I think it is this harpsichord because the black keys of the harpsichord are same coloured as the white line between black lines." Then I explained Handel's masterpieces and his life to my son in front of the portraits. One of these portraits is a typical Handel portrait in which he is wearing a wig. Having looked at this, my son coloured Handel's face on the colouring sheet for children distributed at the Bate Collection family fun day event. Looking at another portrait of Handel with his harpsichord, my son discovered that the composer was bald. I had not noticed this sort of detail although I had seen the portrait many times before. Children have a viewpoint completely different from ours*. Therefore, I find great pleasure in going to the museum with children.

Seeing the harpsichord makes children want to hear its actual sound and that of other instruments on exhibit. Some CDs recorded by the Bate Collection using the instruments they have on exhibit, such as one entitled "Henry Purcell Suites", are available at the museum.

The Bate Collection also includes the harpsichord with Haydn's portrait. It is said that Haydn played this harpsichord when he came to Oxford to receive the degree of Doctor of Music. As I was able to get a sense of his personality by looking at the portrait, I think that portraits provide us with a large amount of information. In addition, I hope that children can become interested in the historical background of specific periods by looking at composers' portraits.

4.2. Studies of the geography and history of the region³⁹

Comprehensive studies of musical instruments together with regional details, such as geography and history, should be effective in helping children to understand a region. To implement this learning method, I selected the Aztec, Mayan, and Inca civilizations. My planned study processes were as follows:

1. Learn about the history of the Americas, particularly the Aztec, Mayan, and Inca civilizations.

³⁸ Hélène La Rue: Explanation for the CD titled "Handel's 1720 Harpsichord Handel Suites 1-5" by Martin Souter, Bate Collection, Oxford, 2002.

* Other interesting questions were "In Africa, is the hair of the zebra's tail used as a bow?" and "Using the talking drum, can you express today's school lunch menu?"

³⁹ Yukari Shirota: "Let's Find the Musical Instruments in the Aztec, Maya, and Inca Worlds", Private discussion paper, 15 October, 2006.

2. Learn about the musical instruments of the times and the region.
 - What musical instruments were there?
 - Why and how were the instruments played?
3. Find and look at the musical instruments of the Aztec, Mayan, and Inca worlds at the PRM.

In implementing this, the brochure for a special exhibition on the musical instruments of the Aztec and Mayan civilizations published by the Hamamatsu Museum of Musical Instruments was helpful⁴⁰. The museum has also published brochures about African and Oceanic instruments, and these were helpful in learning about various aspects of that region and its musical instruments^{41, 42}.

The biggest surprise for us was that string instruments were practically unknown in the Americas, that is among the Inca, Aztec and Mayan peoples. After my son and I had been pondering the reason, I received the answer from Dr H el ene La Rue on 2 November, 2006. It was because there were no horses in the Americas. Horse tails are the best materials for a bow. Because there were no ideal bow materials, there were no string instruments in the Americas. This lesson made us more interested in the relationship between musical instruments and the materials obtainable in specific countries/regions.

After surveying the instruments in picture books, we visited the PRM. There we were pleased to find actual musical instruments similar to those in the picture books. However, it was difficult for us to find the musical instruments because even if the area name is Mexico, for example, we were unsure whether the time of the musical instrument was before or after the Spanish Conquest. However, this kind of search at the museum is very educational because:

1. The search requires geographical knowledge of the Americas.
Children have to learn and be able to spot the differences among the civilizations (countries): Aztec (Mexico), Mayan (Guatemala) and Inca (Peru, Chile, Ecuador, etc.).
2. Historical knowledge is also needed. The biggest piece of knowledge is about the Spanish Conquest.
3. Intense reading of the exhibit explanations is necessary.
4. Children are able to imagine peoples' lives in these civilizations through their musical instruments.

I think that searching for musical instruments in this way would be educational for children

⁴⁰ Hamamatsu Museum of Musical Instruments: "Musical Instruments of Mexico & Guatemala", Hamamatsu Museum of Musical Instruments, 2000 (in Japanese).

⁴¹ Hamamatsu Museum of Musical Instruments: "Musical Instruments of Africa", Hamamatsu Museum of Musical Instruments, 2002 (in Japanese).

⁴² Hamamatsu Museum of Musical Instruments: "Musical Instruments of Oceania", Hamamatsu Museum of Musical Instruments, 2001 (in Japanese).

of aged seven to 11 because it requires much preparation before they can identify the musical instruments at the museum.

4.3. Comparison between European and Asian/African musical instruments⁴³

The target area of this research is musical instruments at an early age. One of my areas of particular interest is capturing children's responses to different cultures. Many people from a Western culture are familiar with Western/European music idioms and sounds, but not particularly familiar with Eastern/Asian idioms and sounds. An interesting study would be on the ways of teaching these differences at an early age, gauging young children's reactions to different musical cultures. A more ethnographic study might be to determine how early in life music cultures are embedded within a child's likes/dislikes. In my case, my favourite sound is the sharp sound of the Nohkan, a Japanese flute played in Noh theatres/dramas. Noh and Kyogen are explained on the Internet⁴⁴.

In European Music, time, such as a common time and a triple time, is strictly defined and maintained. On the other hand, there are two kinds of rhythm in Noh: (1) fixed duration and (2) flexible duration. The playing pattern between the Otsuzumi and the Kotsuzumi, Japanese Noh percussion instruments, is so complicated that the uninitiated sometimes misinterpret it as ad-lib. I am interested in how European children, who are accustomed to strictly maintained time, feel when they hear Noh music.

To gain an understanding of Noh music, the following two books are helpful:

- Frank Hoff and Willi Flindt: The Life Structure of Noh (An English Version of Yokomichi Mario's Analysis of the Structure of Noh), Nogaku Shorin, Hinoki Shoten, Wanya Shoten, Tokyo, 1973.
- P. G. O' Neill, A Guide To No, Hinoki Shoten, Tokyo, 1954.

Before leaving Japan, I took my son who was then aged six years, to a Kyogen performance in Tokyo. Kyogen is traditionally staged between Noh performances. As it is too difficult for younger children to appreciate the spirit of Noh (and so my son would be able to stay in his seat during the performance), I selected Kyogen for him. As I intended to take him to as many medieval musical performances in Oxford as possible, I thought that he should have the chance to appreciate Japanese traditional music before hearing much European music. Although he cannot spot the differences among the music and the sound idioms, I think that he is at least able to feel the diversity of the music.

I possibly would like to make the investigation of young children's reactions to different musical cultures a continuous part of my future work.

⁴³ Yukari Shirota: "Music of Noh Theatre", Private discussion paper, 7 July, 2006.

⁴⁴ The Japan Arts Council: "NOH & KYOGEN, An introduction to Noh & Kyogen", at <http://www2.ntj.jac.go.jp/unesco/noh/en/index.html>, 2004.

4.4. Questions concerning a child's favourite instruments

I always ask my son during a museum excursion, "If you were told that your favourite instrument would be given to you, which instrument would you select?" Of course, he knows that the instrument on exhibit is too valuable for us to obtain, but such questions make him much more interested in the musical instruments. Another question might be, "Which instrument would you like to learn to play?" Additional questions are, "Why do you like the instrument?" "Why would you like to play the instrument?" "How do you like the sounds?"

Both before and after seeing the exhibitions, I think a teacher or a parent should ask the children such questions. And, when he/she begins to talk about his/her favourites, the parent should concentrate on what the child is saying. At the same time, parents should think about their favourite instruments from the same viewpoint as the child.

Additionally, I think that indices concerning children's first impressions are also important. For example, the degree of a child's interest (high to low) in a musical instrument and the extent to which he/she finds the instrument appealing (high to low) are valuable. Recording such personal impressions helps make the instrument and its sounds memorable for children.

5. Conclusion

In this paper, I have described my proposal for the educational uses of museums of musical instruments. It is a great fun to visit musical instrument museums with children. Through seeing instruments from the same viewpoint as children, we are able to notice different things which surprise and move us. At the museum, we can imagine the lifestyle of the ancient music players and the materials of their regions through the musical instruments. I would like to say again, "Let's go to the museum with children." To make the visit fruitful for children, preparation using the virtual museum and various Web sites and follow-up work analyzing the objects which the children saw at the museum, as well as using the virtual museum and various Web sites are required. When I consider virtual museum construction as a database researcher, the important thing to keep in mind is that the most significant experience for children is seeing and listening to the actual instruments, and, if possible, playing them. Multimedia databases must play a supporting role to help and supplement the children's actual experiences with a lot of information.

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